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Sound Level Assessment Report

J-1 Sound Level Assessment Report

SOUND LEVEL ASSESSMENT REPORT

Ball Hill Wind Project
Towns of Villenova & Hanover
Chautauqua County, NY

Prepared for:

Renewable Energy Systems Americas Inc.
11101 West 120th Avenue, Suite 400
Broomfield, CO 80021

Prepared by:

Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA 01754

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1.0 EXECUTIVE SUMMARY

Epsilon Associates, Inc. (Epsilon) has conducted a sound level assessment for Renewable Energy Systems Americas, Inc. (RES) of the Ball Hill Wind Project, a proposed wind power generation facility in Chautauqua County, New York. RES is considering up to 29 wind turbine generators comprised of Vestas V126-3.45 units with a hub height of 87 meters and a rotor diameter of 126 meters. The study references a previously completed sound-monitoring program conducted to determine existing sound levels in the vicinity of the Project, includes computer modeling to predict future sound levels when the wind turbines and the associated electrical substations are operational, and compares the operational sound levels to applicable state and local criteria.

Sound impacts associated with all 29 proposed wind turbine generators and two proposed electrical transformers were modeled at 768 discrete receptor locations, including the closest structures, using Cadna/A noise calculation software. Maximum operational sound levels at all of the nearest structures to the Project are predicted to be equal to or less than 50 dBA, in compliance with local noise limits specified by the Towns of Hanover and Villenova. Additionally, the Project is anticipated to meet the suggested noise guidelines recommended by the New York State Department of Environmental Conservation (NYSDEC) to avoid the potential for adverse noise impacts in the community.

An evaluation was also performed to assess tonality and low frequency sound with respect to Project operation. No pure tones were identified in the sound power level spectra for the Vestas V126-3.45 unit, or in the calculated received sound pressure levels at the closest structure to the Project. Low frequency sound levels at all modeled structures are also well below the recommended criteria to avoid disturbance indoors as well as any potential vibration and rattle.

2.0 PROJECT OVERVIEW

Renewable Energy Systems Americas, Inc. (RES) is proposing to install twenty-nine (29) Vestas V126-3.45 wind turbines and a 5.8 mile 115kV transmission line at the proposed Ball Hill Wind Project site (the Project) located in the Towns of Hanover and Villenova in Chautauqua County, NY. Hessler Associates, Inc. (Hessler) completed a background sound level monitoring program in March 2008 to determine existing sound levels in the vicinity of the Project. Epsilon Associates, Inc. (Epsilon) has conducted computer modeling to predict future sound levels when the proposed wind turbines and associated electrical transformers would be operational. The results of this analysis and an evaluation of compliance with applicable criteria are presented herein.

3.0 SOUND METRICS

There are several ways in which sound levels are measured and quantified, all of which use the logarithmic decibel (dB) scale to accommodate the wide range of sound intensities found in the environment. An interesting property of the logarithmic scale is that the sound pressure levels of two distinct sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total sound level is only a three-decibel increase (to 53 dB), not a doubling to 100 dB. Thus, every three dB change in sound level represents a doubling or halving of sound energy. A change in sound level of less than three dB is generally considered just perceptible to the human ear[1].

Another property of the decibel scale is that if one source of sound is 10 dB (or more) louder than another source, then the quieter source does not contribute significantly to the overall sound level which remains the same as that of the louder source. For example, the combined sound level of a source of sound at 60 dB plus another source of sound at 47 dB is simply 60 dB.

The sound level meter used to measure noise is a standardized instrument.[2] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various conditions. One network is the A-weighting network (there are also B- and C-weighting networks). The A-weighted scale (dBA) most closely approximates how the human ear responds to sound at various frequencies, and is typically used for community sound level measurements[3]. Sounds are frequently reported as detected with the A-weighting network of the sound level meter. A-weighted sound levels emphasize the middle frequency (*i.e.,* middle pitched – around 1,000 Hertz (Hz) sounds), and de-emphasize lower and higher frequency sounds. A-weighted sound levels are reported in decibels designated as "dBA." For reference, sound pressure levels for some common indoor and outdoor environments are shown in Figure 3-1.

Two methods exist for describing sounds in our environment that vary with time: these are exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment A-weighted sound level measurements. Several sound level metrics that are commonly reported in community sound monitoring programs are described below.

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[1] Bies, David A., and Hansen, Colin H. *Engineering Noise Control: Theory and Practice*. 4th ed. New York: Spon Press, 2009. 85. Print

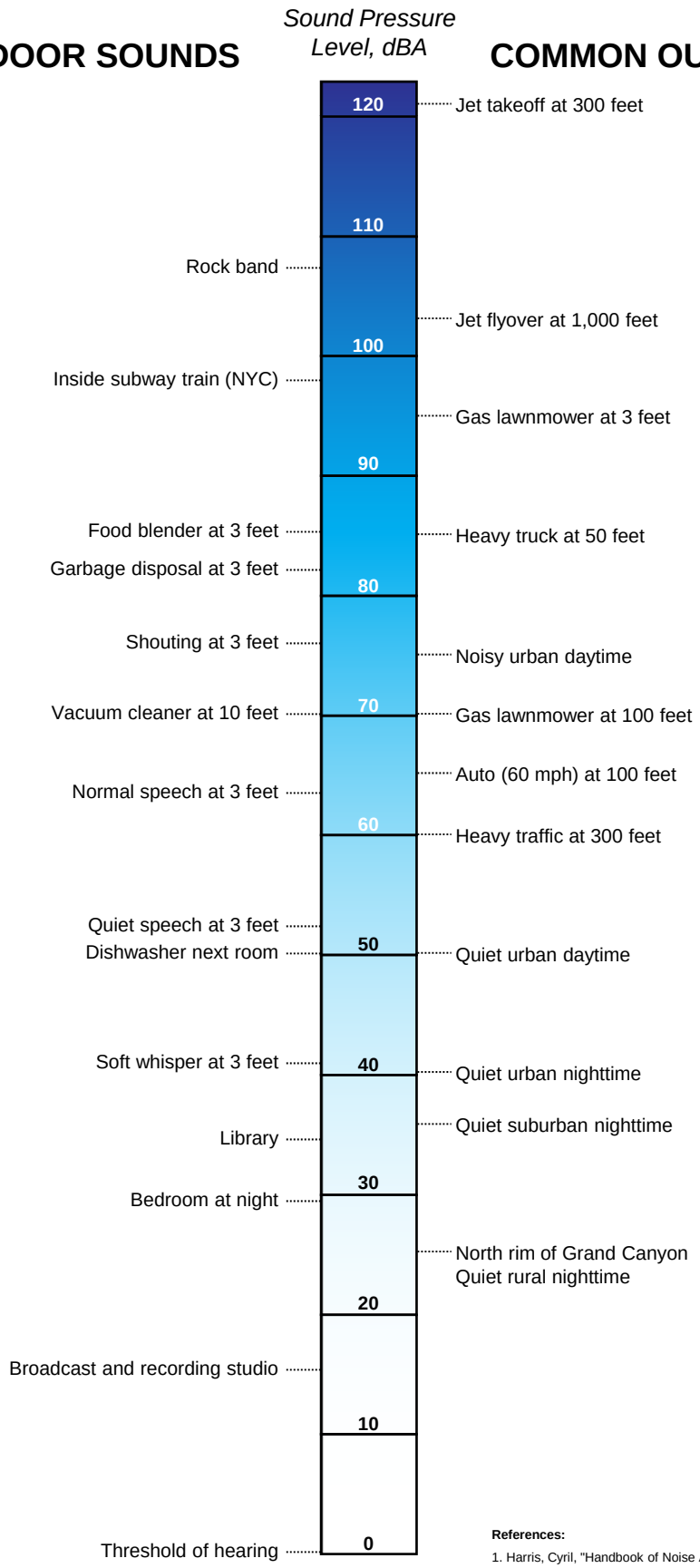
[2] American National Standards Institute. *"ANSI S1.4-1983: Specification for Sound Level Meters."* Acoustical Society of America.

[3] Bies, David A., and Hansen, Colin H. *Engineering Noise Control: Theory and Practice*. 4th ed. New York: Spon Press, 2009. 103. Print

- Exceedance levels, designated L_n, where n can have a value of 0 to 100 percent, are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period and is close to the lowest sound level observed. It is essentially the residual sound level when there are no obvious nearby intermittent noise sources. L_{10} is the sound level in dBA exceeded 10 percent of the time during the measurement period.

- L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (*i.e.,* the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq} and is also A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by occasional loud noises, such as a passing vehicle or an aircraft flyover.

In short, by using various sound metrics it is possible to separate prevailing, steady sounds (the L_{90}) from occasional, louder sounds (L_{10}) in the acoustic environment or combined equivalent levels (L_{eq}).



References:

1. Harris, Cyril, "Handbook of Noise Acoustical Measurements and Noise Control", p 1-10., 1998
2. "Controlling Noise", USAF, AFMC, AFDTC, Elgin AFB, Fact Sheet, August 1996
3. California Dept. of Trans., "Technical Noise Supplement", Oct, 1998

4.0 NOISE REGULATIONS

Noise is officially defined as "unwanted sound". The principal feature of this definition is that there must be sound energy and that there must be someone hearing it who considers it unwanted. Noise impact is judged on two bases: the extent to which governmental regulations or guidelines may be exceeded, and the extent to which it is estimated that people may be annoyed or otherwise adversely affected by the sound. Regulatory authority for assessing and controlling noise is contained in both the State Environmental Quality Review Act (SEQRA) and specific Department program policy documents. Specific regulatory references are discussed below.

4.1 Federal Regulations

There are no federal community noise regulations applicable to wind farms.

4.2 New York State Regulations

Noise is an aspect of the environment under SEQRA (see 6 NYCRR 617.2(1)), and a substantial adverse change in existing noise levels can be (if not mitigated to the maximum extent practicable) among the indicators of significant adverse impacts on the environment.

4.3 Local Regulations

Article XVI, Section 1606 (Zoning District and Bulk Requirements), Parts 3 through 6 of the Town of Hanover Wind Law contains a noise limit applicable to Wind Energy Conversion Systems (WECS) which requires that:

> "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 application. If the ambient sound 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.

In the event audible noise due to WECS operation contains a steady pure tone, such as a whine, screech or hum, the standards for audible noise set forth in this subsection shall be reduced by five 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 bands by:

- 5 dB for center frequencies of 500 Hz or above
- 8 dB for center frequencies between 160 and 500 Hz
- 15 dB for center frequencies less than or equal to 125 Hz

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."

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 an identical noise limit to the Town of Hanover, as described above.

4.4 NYSDEC Guidelines

The NYSDEC has published a guidance document[4] for assessing noise impacts (NYSDEC, 2001). The guidance document states that the addition of any noise source, in a non-industrial setting, should not raise the ambient noise level above a maximum of 65 dBA. Ambient sound levels in industrial or commercial areas may exceed 65 dBA with a high end of approximately 79 dBA. In these instances, mitigation measures utilizing best management practices should be used in an effort to ensure minimum impacts.

This guidance document also states that sound level increases from 0-3 dBA should have no appreciable effect on receptors, increases from 3-6 dBA may have potential for adverse noise impact only in cases where the most sensitive of receptors are present, and increases of more than 6 dBA may require a closer analysis of impact potential depending on existing sound levels and the character of surrounding land use and receptors. An increase of 10 dBA deserves consideration of avoidance and mitigation measures in most cases.

The typical ability of an individual to perceive changes in noise levels is summarized in Table 4-1. These guidelines allow direct estimation of an individual's probable perception of a change in community noise levels.

Table 4-1 Thresholds for Sound Pressure Level Increases

Increase in Sound Pressure (dBA)	Community Reaction
0-3	No appreciable effect
3-6	Potential effect for sensitive receptors
Over 6	Closer analysis required

Source: NYSDEC, "Assessing and Mitigating Noise Impacts", Division of Environmental Permits, February 2, 2001.

[4] Program Policy Assessing and Mitigating Noise Impacts issued by the New York State Department of Environmental Conservation (NYSDEC), Feb. 2001

5.0 EXISTING SOUND LEVELS

Details of the existing sound level measurement methodology, measurement locations, instrumentation, and meteorological conditions can be found in §2.0 of the Environmental Sound Survey and Noble Impact Assessment Report issued by Hessler Associates, Inc. [Report No. 1813-063008-A], dated July 16, 2008 ("Hessler's Report"). A brief discussion of the measured background sound levels as a function of wind speed for use in evaluating compliance with NYSDEC noise guidelines can be found in §6.0 below.

6.0 FUTURE CONDITIONS

6.1 Equipment and Operating Conditions

6.1.1 Vestas V126-3.45 Wind Turbines

Each of the twenty-nine (29) proposed Vestas V126-3.45 wind turbines being considered for the Ball Hill Wind Project have a rotor diameter of 126 meters and a hub height of 87 meters. Table 6-1 presents the manufacturer-provided broadband sound power level, PWL, as a function of wind speed for the Vestas unit used as input to the model. Under peak sound-producing operating conditions, each turbine has an A-weighted sound power level of 107.3 dBA plus an uncertainty factor of 2.0 dBA, as provided by the manufacturer. Octave-band sound power levels, as calculated from one-third octave band data, are presented in Table 6-2 for hub height wind speeds of 11 m/s, corresponding to the maximum A-weighted sound power level output. This represents the operating condition for which compliance with the Town of Hanover and Town of Villenova noise limit of 50 dBA shall be evaluated.

Table 6-1 Vestas V126-3.45 Broadband Sound Power Level (dBA) as a Function of Wind Speed

	Wind Speed at Hub Height of 87m AGL (m/s)							
	4	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Turbine PWL[1] (dBA)	91.9	93.2	96.2	99.5	102.5	105.2	107.1	107.3

1. Does not include uncertainty factor

Table 6-2 Vestas V126-3.45 Octave-Band Sound Power Levels (dBA)

Turbine PWL[1] (dB) by Octave-Band Center Frequency (Hz)								
31.5 Hz	**63 Hz**	**125 Hz**	**250 Hz**	**500 Hz**	**1 kHz**	**2 kHz**	**4 kHz**	**8 kHz**
76.2	85.9	92.6	99.0	102.4	102.9	97.8	90.0	69.4

1. Octave-band sound power levels at hub height wind speeds of 11 m/s, not including uncertainty factor

The NYSDEC criteria discussed in §4.4 is based on an evaluation of the increase over ambient sound levels which vary both as a function of turbine output and wind speed. Critical operating conditions occur at a wind speed when the turbine sound level is highest relative to the ambient sound level. Table 6-3 below compares the relative difference between turbine output and ambient sound level based on the regression analysis provided in Figure 2.7.2 of Hessler's report which presents the measured background L_{eq} sound level as a function of normalized wind speed at 10 meters above ground level (AGL).

It can be seen from Table 6-3 that a hub height wind speed of 10 m/s corresponds to the highest wind turbine sound power output relative to measured background sound levels, representing "critical-case" conditions in terms of an increase over ambient. For the Vestas V126-3.45 turbine model, the turbine sound power output at this wind speed is only 0.2 dBA less than the maximum output at 11 m/s.

Table 6-3 Comparison of Background SPL and Vestas V126-3.45 Turbine PWL to Determine "Critical-Case" Design Wind Speed

Wind Speed at 87m (m/s)	4	5	6	7	8	9	**10**	11	12	13
Wind Speed at 10m[1] (m/s)	2.8	3.6	4.3	5.0	5.7	6.4	**7.1**	7.8	8.5	9.2
Turbine PWL (dBA)	91.9	93.2	96.2	99.5	102.5	105.2	**107.1**	107.3	107.3	107.3
Background L_{eq} SPL[2] (dBA)	39.5	40.2	41.0	41.8	42.5	43.3	**44.1**	44.8	45.6	46.4
Turbine PWL – Background SPL (dBA)	52.4	53.0	55.2	57.7	60.0	61.9	**63.0**	62.5	61.7	60.9

1. Normalized using logarithmic profile described in IEC Standard 61400-11, Equation (7)
2. Calculated using regression line equation provided in Figure 2.7.2 of Hessler's report

6.1.2 Transformers

A 5.8 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. The two transformers were included in the model assuming the sound power level inputs presented in Table 6-4 below, as calculated based on their respective MVA ratings.

Table 6-4 Transformer Sound Power Levels[1] (dBA)

MVA	dBA	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
120	100	57	76	88	91	96	93	89	84	75
230	102	59	78	90	93	98	95	91	86	77

1. Based on MVA rating of 120 or 230 MVA, as calculated using the methodology described in Table 4.5 of the Edison Electric Institute's "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.

6.2 Modeling Methodology

Sound impacts associated with the proposed wind turbine generators and proposed substation transformers were predicted using Cadna/A noise calculation software

(DataKustik Corporation, 2015). This software, which implements the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation), offers a refined set of computations accounting for local topography, ground attenuation, drop-off with distance, barrier shielding, and atmospheric absorption of sound from multiple sound sources.

Inputs and significant parameters employed in the model are described below:

- *Project Layout:* A project layout comprised of a total of 29 proposed wind turbine locations and two proposed transformer locations was provided by RES along with a shapefile of the Project property boundary for use as input in the model.

- *Sensitive Receptors:* A shapefile of 768 receptors, including the closest structures to the Project, was provided by RES and used as input to the model. All receptors were modeled with a height of 1.5 meters AGL to mimic the ears of a typical standing observer.

- *Terrain Elevation:* Elevation contours for the modeling domain with 3 meter resolution were directly imported into Cadna/A which allowed for consideration of terrain shielding where appropriate. These contours were generated from elevation information derived from the National Elevation Database (NED) developed by the U.S. Geological Survey.

- *Source Sound Levels & Controls:* Manufacturer-provided octave-band sound power levels for the Vestas V126-3.45 MW units, presented above in §6.1.1 were used as input in the model.

- *Meteorological Conditions:* A temperature of 10ºC (50ºF) and a relative humidity of 70% was assumed in the model.

- *Ground Attenuation:* Spectral ground absorption was calculated using a G-factor of 0.5 to represent a moderately reflective surface.

Several modeling assumptions inherent in the ISO 9613-2 calculation methodology, or selected as conditional inputs by the user, were implemented in the Cadna/A model to ensure conservative results (i.e., higher sound levels), and are described below:

- Modeled source sound power level inputs represent acoustic emissions measured in accordance with IEC 61400-11 corresponding to maximum sound power output, plus an additional manufacturer-provided uncertainty factor of 2 dBA for the wind turbines.

- All modeled sources were assumed to be operating simultaneously and at the design wind speed corresponding to maximum sound power emissions.

- Predicted sound levels were computed with the assumption that each receptor was always located directly downwind from every turbine simultaneously. While a physical impossibility, this provides conservative results and is required by the ISO 9613-2 standard.

- As per ISO 9613-2, the model assumed favorable conditions for sound propagation, corresponding to a moderate, well-developed ground-based temperature inversion, as might occur on a calm, clear night.

- A mixture of hard and porous ground was assumed for the surrounding Project area to represent a surface that is partially reflective, a conservative assumption for much of the year when the ground would be covered in vegetation.

- Meteorological conditions assumed in the model (T = 10°C/RH = 70%) were selected to minimize atmospheric attenuation in the 500 Hz and 1 kHz octave-bands where the human ear is most sensitive.

- No additional attenuation due to tree shielding, air turbulence, or wind shadow effects was considered in the model.

Sound levels due to the operation of all 29 wind turbines and the two transformers were modeled at each of the 768 discrete receptor locations, including the closest structures to the Project. In addition, sound levels were modeled across a large grid of receptor points, spaced 100 meters apart, to create sound level isopleths across the entire Project area.

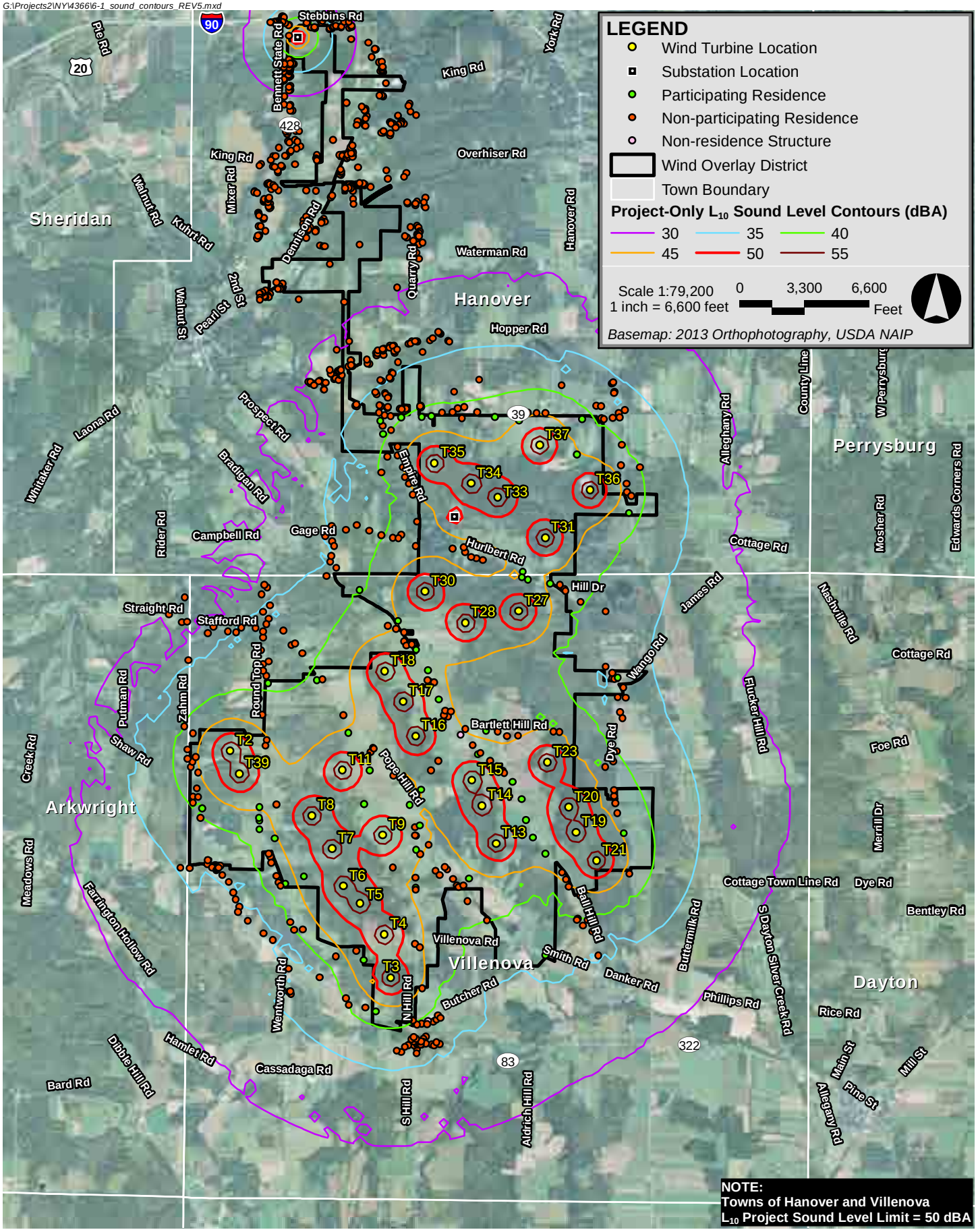
6.3 Modeling Sound Level Results

Modeling results for the Vestas V126-3.45 turbine, representing maximum Project-only L_{10} sound levels, are illustrated in Figure 6-1 as iso-dBA contour lines overlaid on aerial imagery of the Project site. Predicted L_{10} sound levels, ranging from 20 to 49 dBA, and L_{eq} sound levels, ranging from 19 to 48 dBA, at the closest structures to the Project are presented in tabular form in Table A-1 of Appendix A at all 768 discrete modeling receptors. These predicted sound levels which contain a wind turbine manufacturer-provided uncertainty factor of 2 dBA are "Project-only" and do not include any contributions from existing background sound sources.

The calculated maximum L_{10} values shown in Figure 6-1 and presented in Table A-1 include an adjustment of 1 dBA added to the modeled maximum L_{eq} turbine sound levels. This allows for the approximate conversion of L_{eq} to L_{10} sound levels used for evaluating compliance with the local noise limits, and is based on empirical data from several Epsilon Associates, Inc. measurement programs where wind turbines are the primary noise source.

In addition, data from a recent acoustical research study found similar results where the L_{10} sound level is approximately 1 dBA higher than the L_{eq} sound level.[5]

[5] RSG et al, "Massachusetts Study on Wind Turbine Acoustics," Massachusetts Clean Energy Center and Massachusetts Department of Environmental Protection, 2016.



Ball Hill Wind Project Hanover & Villenova, New York

Epsilon

Figure 6-1

Maximum Project-Only L_{10} Sound Levels
Vestas V126-3.45 MW (11m/s at 87m HH)

7.0 EVALUATION OF SOUND LEVELS

7.1 Local Regulations

As presented in Table A-1 of Appendix A and illustrated in Figure 6-1, predicted L_{10} sound levels from the Project under conditions of maximum wind turbine sound output (corresponding to a hub height wind speed of 11 m/s) are less than or equal to the 50 dBA limit specified by the Towns of Hanover and Villenova at all receptors representing the closest structures to the Project.

With regard to "pure tones", as defined in §4.3, an evaluation of the maximum one-third octave-band sound power levels for the Vestas V126-3.45 model, provided by the turbine manufacturer, is presented in Table 7-1. This analysis indicates that even under conditions of maximum turbine sound power output, corresponding to hub height wind speeds of 11 m/s, no pure tones shall be emitted.

Table 7-1 Tonal Analysis: Vestas V126-3.45 Sound Power Level Emissions

One-Third Octave-band Center Frequency (Hz)	Sound Power Level[1] (dB)	Average Sound Power Level of Contiguous Bands (dB)	Difference between Sound Power Level and Contiguous Average[2] (dB)	Tonal Limit (dB)	Meets Tonal Limit?[3]
25	114.3	-	-	-	-
32	108.6	111.4	-3	15	Yes
40	108.5	108.4	0	15	Yes
50	108.1	107.9	0	15	Yes
63	107.3	106.8	0	15	Yes
80	105.5	106.0	0	15	Yes
100	104.6	105.1	0	15	Yes
125	104.6	103.4	1	15	Yes
160	102.1	103.3	-1	8	Yes
200	102.0	102.1	0	8	Yes
250	102.1	102.5	0	8	Yes
315	103.0	101.8	1	8	Yes
400	101.5	101.9	0	8	Yes
500	100.7	101.0	0	5	Yes
630	100.4	99.8	1	5	Yes
800	98.8	99.5	-1	5	Yes
1000	98.5	98.0	1	5	Yes
1250	97.1	95.9	1	5	Yes
1600	93.3	94.6	-1	5	Yes
2000	92.1	91.5	1	5	Yes
2500	89.7	89.2	1	5	Yes
3150	86.3	87.4	-1	5	Yes
4000	85.0	81.4	4	5	Yes
5000	76.5	76.8	0	5	Yes
6300	68.6	69.1	0	5	Yes

Table 7-1 Tonal Analysis: Vestas V126-3.45 Sound Power Level Emissions (Continued)

One-Third Octave-band Center Frequency (Hz)	Sound Power Level[1] (dB)	Average Sound Power Level of Contiguous Bands (dB)	Difference between Sound Power Level and Contiguous Average[2] (dB)	Tonal Limit (dB)	Meets Tonal Limit?[3]
8000	61.6	63.9	-2	5	Yes
10000	59.2	-	-	-	-

1. One-third octave-band sound power level for Vestas V126-3.45 turbine at hub height wind speeds of 11m/s
2. Rounded to the nearest whole number decibel
3. Compliance evaluation of "pure tone" criteria described in §4.3

Additionally, one-third octave-band received sound pressure levels were calculated at the closest structure (receptor #177) to a turbine (T15), accounting for geometric divergence and atmospheric absorption, at a distance of approximately 1,150 feet (350 meters). Results presented in Table 7-2 show that received sound pressure levels due to the wind turbines are not expected to result in any pure tones, as defined by the Towns of Hanover and Villenova.

Table 7-2 Tonal Analysis: Vestas V126-3.45 Received Sound Pressure Levels

One-Third Octave-band Center Frequency (Hz)	Received Sound Pressure Level[1] (dB)	Average Sound Pressure Level of Contiguous Bands (dB)	Difference between Sound Pressure Level and Contiguous Average[2] (dB)	Tonal Limit (dB)	Meets Tonal Limit?[3]
25	55.2	-	-	-	-
32	49.5	52.3	-3	15	Yes
40	49.4	49.2	0	15	Yes
50	49.0	48.8	0	15	Yes
63	48.2	47.7	1	15	Yes
80	46.4	46.8	0	15	Yes
100	45.4	45.9	0	15	Yes
125	45.4	44.1	1	15	Yes
160	42.8	44.0	-1	8	Yes
200	42.6	42.7	0	8	Yes
250	42.6	43.0	0	8	Yes
315	43.4	42.2	1	8	Yes
400	41.7	42.0	0	8	Yes
500	40.7	40.9	0	5	Yes
630	40.2	39.5	1	5	Yes
800	38.4	39.0	-1	5	Yes
1000	37.8	37.2	1	5	Yes
1250	36.0	34.7	1	5	Yes
1600	31.6	32.9	-1	5	Yes

Table 7-2 Tonal Analysis: Vestas V126-3.45 Received Sound Pressure Levels (Continued)

One-Third Octave-band Center Frequency (Hz)	Received Sound Pressure Level[1] (dB)	Average Sound Pressure Level of Contiguous Bands (dB)	Difference between Sound Pressure Level and Contiguous Average[2] (dB)	Tonal Limit (dB)	Meets Tonal Limit?[3]
2000	29.8	29.1	1	5	Yes
2500	26.7	25.6	1	5	Yes
3150	21.3	21.8	0	5	Yes
4000	16.9	12.7	4	5	Yes
5000	4.1	8.4	-4	5	Yes
6300	0.0	2.1	-2	5	Yes
8000	0.0	0.0	0	5	Yes
10000	0.0	-	-	-	-

1. Calculated sound pressure level due to a single turbine at a distance of ~1,150 feet (receptor #177), based on Vestas V126-3.45 one-third octave-band sound power levels for hub height wind speeds of 11 m/s
2. Rounded to the nearest whole number decibel
3. Compliance evaluation of "pure tone" criteria described in §4.3

Since no one-third octave-band data has been provided for the substation equipment, a tonal analysis for the proposed transformers has not been conducted. However, as part of the project design, Ball Hill Wind will specify a custom built transformer, and will include a specification that no prominent discrete tone will be created. This unit will be tested for sound after it is built.

7.2 NYSDEC Criteria

The predicted L_{eq} sound levels at the nearest structures presented in Table A-1 of Appendix A were compared to the existing ambient L_{eq} sound levels with respect to the NYSDEC criteria discussed in §4.4. As shown in Table 6-3, the calculated background sound level for the Project area at the "critical-case" hub height wind speed of 10 m/s is 44.1 dBA. In order for the Project to meet the suggested 6 dBA cumulative increase threshold recommended in the NYSDEC guidance document, L_{eq} sound levels from the Project should remain at or below 48.8 dBA. That is to say, a Project level of 48.8 dBA added to a background level of 44.1 dBA would result in a combined level of 50.1 dBA, which is 6 dBA above background, when rounded to the nearest whole decibel.

Maximum L_{eq} sound levels from the Project at all of the nearest structures are predicted to be no greater than 48.8 dBA even under conditions of maximum turbine sound power output. Additionally, future sound levels combining the Project with the existing background are anticipated to remain less than or equal to 50 dBA, well below the suggested 65 dBA threshold recommended in the NYSDEC guidance document.

7.3 Low Frequency Sound

Table 7-3 compares predicted maximum Project-only L_{10} sound levels in the 32, 63 and 125 Hz octave-bands to the equivalent outdoor sound pressure levels corresponding to the NC-30 noise criteria curve recommended for bedrooms and to levels associated with moderately perceptible vibration and rattle."[6] Results indicate that of the ten structures of greatest potential Project impact, predicted sound levels are well below both relevant criteria, indicating that no low-frequency sound impacts are expected.

Table 7-3 Predicted Worst-Case Low Frequency Sound Levels

Modeling Receptor ID	Sound Pressure Level (dB)		
	31.5 Hz	63 Hz	125 Hz
	(dB)	(dB)	(dB)
177	62	58	51
376	49	54	52
178	61	57	50
179	61	57	50
180	61	57	50
151	61	57	50
175	61	57	50
176	61	57	50
174	61	57	50
172	61	57	50
NC-30 Equivalent Outdoor Sound Pressure Levels	74	66	57
Equivalent Outdoor Sound Pressure Levels for Moderately Perceptible Vibration & Rattle	71	79	NA

Another metric commonly used to assess low frequency noise is the "C-weighted" sound level. For the Vestas V126-3.45 turbine, the maximum C-weighted sound level at any of the modeling receptors representing the closest structures to the Project is predicted to be less than or equal to 63 dBC. For context, ANSI Standard B133.8 "Gas Turbine Installation

[6] O'Neal, Robert D., Hellweg Jr., Robert D., Lampeter, Richard M. "Low Frequency Noise and Infrasound from Wind Turbines." Noise Control Engineering Journal 59.2 (2011): 139. Print.

Sound Emissions" describes a threshold of 75 to 80 dBC as the approximate level at which complaints and the perception of vibrations due to airborne sound may occur.

7.4 Construction Noise

A qualitative discussion of construction noise related to the proposed Ball Hill Wind Project can be found in §3.9 of Hessler's report.

8.0 CONCLUSIONS

A comprehensive sound level assessment conducted for the Ball Hill Wind Project indicates that predicted sound level impacts from the 29 proposed Vestas V126-3.45 wind turbine generators and two proposed electrical transformers are expected to meet the Town of Hanover and Town of Villenova noise limit at each of the closest structures to the Project. Additionally, the Project is anticipated to meet the suggested criteria recommended in the NYSDEC guidance document for avoiding the potential for adverse community noise impacts. No pure tones were identified in the sound power level spectra, nor in the calculated received sound pressure levels 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, noise from the project is likely to 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. A vast majority 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. Project impacts are anticipated to meet state guidelines for minimizing adverse impacts as well as all local noise limits applicable to the Project.

Appendix A
Vestas V126-3.45 Sound Level Modeling Results

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
1	302835	265921	46	45
2	302817	265099	43	42
3	305211	265779	43	42
4	303337	270719	37	36
5	306582	273125	45	44
6	306448	273126	45	44
7	306310	273130	44	43
8	306063	273131	43	42
9	305523	273141	41	40
10	304592	271431	43	42
11	304524	271857	44	43
12	304464	272023	45	44
13	304408	272125	45	44
14	304370	272276	45	44
15	304291	272464	43	42
16	304288	272601	43	42
17	304129	272449	41	40
18	304063	272798	39	38
19	304054	272920	39	38
20	304025	273005	38	37
21	304089	273088	38	37
22	304345	273055	40	39
23	304667	273065	42	41
24	304815	273077	42	41
25	305292	273044	42	41
26	305322	273216	41	40
27	305800	273064	42	41
28	306179	273013	45	44
29	307071	272480	46	45
30	306588	264701	37	36
31	307892	265960	44	43
32	307805	266595	45	44
33	307706	266908	43	42
34	307670	267064	44	43
35	307651	267168	42	41
36	307650	267265	41	40
37	307520	267624	42	41
38	307696	267868	40	39
39	307640	267712	41	40
40	307788	268380	37	36
41	307746	268479	37	36
42	307714	268704	37	36

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting]	Y [Northing]		
	(m)	(m)		
43	307627	269003	37	36
44	307655	268993	36	35
45	307626	269084	36	35
46	307132	270187	41	40
47	301451	266094	36	35
48	301466	266093	36	35
49	301483	266092	36	35
50	301500	266093	36	35
51	301516	266092	36	35
52	301532	266092	36	35
53	301570	265944	36	35
54	301671	265836	36	35
55	301738	265672	35	34
56	301780	265566	35	34
57	301829	265450	35	34
58	301965	265234	35	34
59	302204	265039	34	33
60	302353	264933	35	34
61	303080	264353	38	37
62	303951	263822	43	42
63	303790	263883	42	41
64	303484	264028	40	39
65	304671	264182	44	43
66	301336	266118	36	35
67	301338	266177	36	35
68	301228	266832	40	39
69	301114	267071	41	40
70	301116	267164	41	40
71	301191	267536	45	44
72	301079	267623	43	42
73	301106	267708	44	43
74	301041	269283	35	34
75	302266	270414	34	33
76	302218	270455	33	32
77	302179	270309	33	32
78	302198	270031	35	34
79	302304	270136	35	34
80	302288	269923	36	35
81	302252	269847	36	35
82	303188	270587	37	36
83	303244	270812	37	36
84	303257	270903	36	35
85	303267	271364	36	35

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
86	303270	271133	36	35
87	303307	271057	36	35
88	306880	270386	43	42
89	305683	265239	40	39
90	305379	265538	42	41
91	304567	265903	45	44
92	304571	265747	44	43
93	302312	266233	43	42
94	302200	269222	38	37
95	306160	268107	45	44
96	303487	271309	37	36
97	303655	271379	38	37
98	303849	271296	39	38
99	304038	271224	40	39
100	304347	271236	42	41
101	304214	271187	41	40
102	304301	271181	41	41
103	304573	271057	43	42
104	305144	271018	44	43
105	305337	270967	44	44
106	305319	271039	45	44
107	306239	270659	46	45
108	306314	270535	46	45
109	306655	270474	45	44
110	305237	265757	43	42
111	305314	265779	43	42
112	305395	265887	44	43
113	304880	266010	44	43
114	304939	265943	43	42
115	305060	266030	44	43
116	305021	266071	44	43
117	304560	266685	46	45
118	304631	266714	46	45
119	304643	266268	45	44
120	304582	266553	46	45
121	304580	266336	46	45
122	304221	266066	47	46
123	304573	265716	44	43
124	304562	264878	47	46
125	304636	264824	46	45
126	303764	264620	48	47
127	302619	265214	42	41
128	302550	265807	43	42

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
129	302409	265930	43	42
130	302326	266139	43	42
131	302285	266277	43	42
132	302379	266514	45	44
133	302143	266794	44	43
134	302407	267041	46	45
135	302262	268044	45	44
136	302189	268440	43	42
137	302250	269039	39	38
138	302199	269120	38	37
139	302286	269264	38	37
140	302199	269635	37	36
141	302202	269733	36	35
142	302517	269746	37	36
143	302640	269518	38	37
144	302698	269540	38	37
145	302808	269389	39	38
146	303038	268970	41	40
147	303444	268430	44	43
148	303530	268156	46	45
149	303872	267853	47	46
150	303911	267922	47	46
151	303855	267569	48	47
152	304478	267032	46	45
153	304653	267271	45	44
154	304810	267574	47	46
155	304925	267717	47	46
156	306809	268168	45	44
157	306715	268173	45	44
158	306154	268298	43	42
159	305986	268102	44	43
160	305847	268175	44	43
161	305666	268187	44	43
162	307410	264695	36	35
163	307313	265066	38	37
164	307087	265268	40	39
165	307165	265160	39	38
166	307242	265245	40	39
167	306947	265758	45	44
168	306907	265874	46	45
169	306846	265982	46	45
170	306587	266276	47	46
171	306392	266522	47	46

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
172	306280	266803	48	47
173	306214	267120	48	47
174	306072	267387	48	47
175	305920	267565	48	47
176	305950	267530	48	47
177	305730	267653	49	48
178	305830	267632	48	47
179	305729	267720	48	47
180	305540	267818	48	47
181	305461	267962	46	45
182	305346	268213	45	44
183	305077	268412	46	45
184	305007	268430	47	46
185	305030	268499	46	45
186	305116	268483	45	44
187	304928	268671	47	46
188	304793	268945	47	46
189	304852	268940	46	45
190	304762	269125	46	45
191	304137	269816	45	44
192	304268	269771	45	44
193	304391	269573	46	45
194	304424	269508	46	45
195	304578	269443	46	45
196	304511	269528	46	45
197	304389	269720	45	44
198	304296	269893	45	44
199	303701	270372	40	39
200	304983	273128	42	41
201	305140	273136	41	40
202	305222	273197	41	40
203	307157	273030	41	40
204	307459	273045	40	39
205	307496	273029	39	38
206	307631	273047	39	38
207	307725	273122	38	37
208	307739	273054	38	37
209	307820	273167	37	36
210	307770	272626	40	39
211	308054	272278	40	39
212	307760	272313	43	42
213	307851	271897	43	42
214	307919	271835	42	41

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
215	307525	270039	38	37
216	306902	270361	42	41
217	305613	270835	44	43
218	305510	270866	44	43
219	305433	270887	44	43
220	303164	271210	35	34
221	304756	268970	47	46
222	307127	265624	44	43
223	305147	265883	43	42
224	304777	266410	45	44
225	303534	263922	40	39
226	302441	265831	43	42
227	305267	268124	46	45
228	302146	266999	45	44
229	302684	265087	41	40
230	303648	264766	47	46
231	303329	264680	44	43
232	303767	267050	47	46
233	300989	270263	29	28
234	300939	269870	29	28
235	300734	269991	29	28
236	301022	269877	29	28
237	300982	268255	41	40
238	301111	268150	43	42
239	301024	267891	43	42
240	301156	267779	45	44
241	301028	267753	43	42
242	301174	267287	43	42
243	301193	267155	41	40
244	301253	266981	41	40
245	301059	266053	36	35
246	300915	266057	35	34
247	301423	266076	36	35
248	301411	266064	36	35
249	301474	266013	36	35
250	301487	266028	36	35
251	301498	266042	36	35
252	301505	266053	36	35
253	301809	265370	34	33
254	302594	264485	35	34
255	302638	264095	36	35
256	302599	264129	35	34
257	302623	264141	36	35

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting]	Y [Northing]		
	(m)	(m)		
258	302474	265774	43	42
259	302146	266655	44	43
260	302141	266834	44	43
261	302241	267952	46	45
262	302140	268685	41	40
263	302277	268929	39	38
264	302169	269437	37	36
265	302088	269783	36	35
266	301866	269792	35	34
267	301782	269714	35	34
268	301654	269728	35	34
269	301431	269805	33	32
270	301343	269705	30	29
271	303123	268986	42	41
272	303921	267910	47	46
273	304227	267491	46	45
274	304561	266556	47	46
275	304942	263321	36	35
276	304823	263316	37	36
277	304725	263437	37	36
278	304669	263313	37	36
279	304602	263271	37	36
280	304593	263236	37	36
281	304584	263172	36	35
282	304488	263322	38	37
283	304544	263298	37	36
284	304696	263398	37	36
285	304686	263355	37	36
286	304728	263326	37	36
287	304851	263295	36	35
288	304895	263345	36	35
289	304593	263315	37	36
290	304617	263316	37	36
291	304645	263313	37	36
292	304581	263360	38	37
293	304627	263358	37	36
294	304653	263358	37	36
295	304537	263360	38	37
296	304453	263302	37	36
297	304406	263272	37	36
298	304345	263191	37	36
299	304276	263213	37	36
300	304583	263402	38	37

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
301	304509	263395	38	37
302	304542	263426	38	37
303	304661	263637	39	38
304	304864	263672	39	38
305	304841	263664	39	38
306	304892	263698	38	37
307	304917	263762	39	38
308	304758	263678	39	38
309	304749	263627	39	38
310	304954	263720	38	37
311	304594	263625	40	39
312	304523	263682	41	40
313	307076	265245	40	39
314	307835	268700	36	35
315	307798	268862	36	35
316	305581	267840	47	46
317	304039	272195	41	40
318	304193	272856	40	39
319	304005	273128	37	36
320	304187	273074	39	38
321	307847	272022	43	42
322	307885	271567	42	41
323	307710	269011	36	35
324	307523	269182	36	35
325	306815	270457	43	42
326	306226	270568	46	45
327	303952	278773	27	27
328	303934	278769	27	27
329	303935	278785	27	27
330	304005	278574	27	26
331	304041	278582	26	26
332	303890	278654	28	27
333	303403	279128	33	33
334	303832	278880	28	28
335	303275	279101	35	35
336	303091	279223	37	37
337	303100	279250	36	36
338	303538	279105	31	31
339	302881	279231	40	40
340	303566	278929	31	31
341	302951	279115	41	41
342	302998	279106	40	40
343	303006	279100	40	40

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
344	302998	279118	40	40
345	303097	279223	37	37
346	303057	279270	32	32
347	303071	279258	37	37
348	303110	279185	37	37
349	303122	279219	36	36
350	303233	279088	35	35
351	303251	279094	35	35
352	303238	279099	35	35
353	303282	279118	35	35
354	303301	279125	34	34
355	303346	279129	33	33
356	303333	279140	34	34
357	303414	279115	33	33
358	303254	279332	33	33
359	303253	279352	33	33
360	303253	279279	34	34
361	303260	279244	34	34
362	303418	279128	32	32
363	303458	279204	27	27
364	303577	279117	31	30
365	303574	279138	31	30
366	303531	279202	26	26
367	302890	279200	41	41
368	302619	278608	38	38
369	302618	278611	38	38
370	302600	278617	38	38
371	302536	278563	37	37
372	302490	278574	36	36
373	302425	278783	39	39
374	302879	279189	41	41
376	302604	278985	47	47
377	302593	279152	42	42
378	302598	279152	42	42
379	302596	279146	42	42
380	302495	279286	38	38
381	302508	279284	38	38
382	302514	279263	38	38
383	302527	279271	38	38
384	302545	279181	41	41
385	302502	279197	39	39
386	302470	279144	40	40
387	302439	279096	40	40

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
388	302444	279126	39	39
389	302424	279132	39	39
390	302411	279141	38	38
391	302435	279216	38	38
392	302419	279197	38	38
393	302394	279207	37	37
394	302375	279201	37	37
395	302330	279194	36	36
396	302314	279193	36	36
397	302660	277826	28	28
398	302622	277825	28	28
399	302622	277912	29	29
400	302611	277896	29	28
401	302528	277916	29	28
402	302621	278357	34	34
403	302623	278150	31	31
404	302599	278137	31	31
405	302621	278208	32	32
406	302600	278189	31	31
407	302601	278340	33	33
408	302611	278359	34	34
409	302594	278377	34	34
410	302613	278425	35	35
411	302592	278441	35	35
412	302617	278450	35	35
413	302630	278469	36	36
414	302625	278479	36	36
415	302600	278486	36	36
416	302674	278547	37	37
417	302664	278554	37	37
418	302608	278545	37	37
419	302624	278556	37	37
420	302416	278043	29	29
421	302457	278037	29	29
422	302532	278046	30	30
423	302461	278204	31	31
424	302437	278232	31	31
425	302435	278240	31	31
426	302491	278276	32	32
427	302525	278289	32	32
428	302519	278290	32	32
429	302523	278305	33	33
430	302482	278396	34	34

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
431	302512	278421	34	34
432	302509	278476	35	35
433	302519	278494	35	35
434	302531	278548	36	36
435	303814	277735	25	25
436	303778	277598	25	25
437	303688	277646	25	25
438	303670	277655	26	25
439	303656	277599	25	25
440	303789	277581	23	22
441	303798	277696	25	25
442	303795	277810	26	25
443	303785	277852	26	26
444	303772	277832	26	26
445	303734	277884	26	26
446	303497	277946	27	27
447	303492	277948	27	27
448	304581	277748	23	22
449	304491	277803	23	22
450	304389	277614	21	20
451	304353	277657	21	21
452	304343	277644	20	20
453	304340	277620	20	20
454	304302	277600	21	20
455	304255	277573	23	23
456	304298	277736	24	24
457	304480	277933	24	24
458	304456	277901	24	24
459	304298	277747	25	24
460	304220	277620	20	19
461	304171	277641	23	22
462	304185	277629	22	22
463	304193	277614	24	23
464	304114	278250	25	25
465	304062	278044	25	25
466	304047	278062	25	25
467	304010	278061	26	25
468	304025	278433	26	26
469	304064	278417	26	26
470	304058	278432	26	26
471	304048	278455	26	26
472	304045	278488	26	26
473	304055	278488	26	26

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
474	304053	278499	26	26
475	303871	276634	22	21
476	304260	277555	23	23
477	304114	276890	22	21
478	304426	276850	22	21
479	304391	276793	22	21
480	304139	276763	22	21
481	304174	277440	21	20
482	304066	277477	24	23
483	304038	277478	24	23
484	304072	277506	24	23
485	304177	277467	23	23
486	303284	277367	26	25
487	302870	276586	22	21
488	303593	276574	22	21
489	303774	276667	22	21
490	303778	276677	22	21
491	303758	276693	22	21
492	303703	276700	22	21
493	303023	276577	23	22
494	303543	276674	22	22
495	303569	276654	22	21
496	303577	276637	22	21
497	303562	276614	22	21
498	303533	276627	22	21
499	303475	276619	22	21
500	303414	276817	22	22
501	303420	276831	22	22
502	303391	276833	22	22
503	303402	276867	22	22
504	303417	276872	22	22
505	303405	276903	22	22
506	303677	276940	22	22
507	303569	277166	23	23
508	303574	277167	23	23
509	303039	277134	25	25
510	303026	277080	25	24
511	303041	277068	25	24
512	303039	277049	25	24
513	303385	277133	24	24
514	303436	277123	24	24
515	303494	277078	23	23
516	303505	277077	23	23

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
517	303535	277098	23	23
518	303514	277141	24	23
519	303602	277112	23	23
520	303585	277102	23	23
521	303592	277177	23	23
522	303592	277165	23	23
523	303566	277158	23	23
524	303559	277257	24	24
525	303590	277285	24	24
526	302437	276861	22	22
527	302444	276583	24	24
528	302329	276605	24	23
529	302269	276682	24	23
530	302354	276951	23	22
531	302775	277268	25	25
532	302447	277249	23	23
533	302385	277112	25	24
534	302359	277114	25	24
535	302317	277052	25	24
536	302574	277464	26	26
537	302585	277491	26	26
538	302555	277494	26	26
539	302567	277548	26	26
540	302581	277522	26	26
541	302589	277345	24	23
542	302607	277328	23	23
543	302710	277501	26	26
544	302761	277502	26	26
545	302696	277368	26	25
546	302739	277344	26	25
547	302724	277233	25	25
548	302616	277181	20	20
549	302632	277198	21	20
550	302695	276984	25	24
551	302561	277113	20	20
552	302544	277123	20	20
553	302393	277115	23	23
554	302492	276944	21	20
555	302483	276963	21	21
556	302426	276888	22	22
557	302378	276946	23	22
558	302175	276994	25	24
559	302143	276966	24	24

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
560	302069	276570	23	22
561	302290	276698	24	23
562	302306	276680	24	23
563	302357	276664	24	23
564	302380	276640	24	23
565	302123	275860	23	22
566	302107	275843	23	22
567	302304	276378	24	23
568	302316	276317	24	23
569	302068	276554	23	22
570	302102	276544	23	22
571	302242	275955	24	23
572	302128	276238	24	23
573	302206	276138	24	23
574	302299	276305	24	23
575	302286	276332	24	23
576	302213	276401	24	23
577	302211	276412	24	23
578	302213	276429	24	23
579	302221	276447	24	23
580	302281	276395	24	23
581	302278	276448	24	23
582	302294	276468	24	23
583	302672	275736	22	21
584	302830	276122	22	21
585	302826	276059	22	21
586	302213	276156	24	23
587	302134	276216	24	23
588	302137	276190	24	23
589	302132	276027	24	23
590	302163	276027	24	23
591	302144	275889	24	23
592	302119	275877	23	22
593	302702	275709	22	21
594	303087	275724	23	22
595	303138	275715	23	22
596	302923	276004	22	21
597	303047	276313	22	21
598	303156	275712	23	22
599	302873	275849	22	21
600	303704	275741	27	26
601	302872	276178	22	21
602	303602	276452	22	21

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
603	303608	276369	22	21
604	303250	276479	22	21
605	303273	276502	22	21
606	303143	276144	22	21
607	303160	276093	22	21
608	303112	276107	22	21
609	303105	276084	22	21
610	303022	275973	22	21
611	303026	275955	22	21
612	303011	275949	22	21
613	302940	276007	22	21
614	302891	275962	22	21
615	302866	276041	22	21
616	302880	276073	22	21
617	302901	275980	22	21
618	304564	275585	28	28
619	304709	276334	27	26
620	304721	276467	26	26
621	304717	276314	27	26
622	304698	276396	27	26
623	304592	276412	26	26
624	304568	276352	27	26
625	304568	276378	27	26
626	304447	276374	26	25
627	304436	276397	26	25
628	304594	276036	27	27
629	304610	276009	28	27
630	304630	275944	28	27
631	304622	275922	28	27
632	304595	275900	28	27
633	304596	275886	28	27
634	304593	275781	28	27
635	304583	275785	28	27
636	304620	275871	28	27
637	304494	276013	27	26
638	304433	275853	27	26
639	304408	275874	27	26
640	304535	275796	28	27
641	304583	275611	28	27
642	304619	275749	28	27
643	304681	275775	28	27
644	304284	275074	30	29
645	304621	275515	29	28

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
646	304543	275188	30	29
647	303460	274849	28	27
648	303237	275436	27	26
649	302229	275008	23	22
650	302756	274888	27	26
651	302500	275138	23	22
652	302463	275086	23	22
653	302459	275095	23	22
654	302473	275057	23	22
655	302469	275046	23	22
656	302432	275049	23	22
657	302408	275159	23	22
658	302260	274966	23	22
659	302309	274975	23	22
660	302277	274948	23	22
661	302289	274924	23	22
662	302237	274924	23	22
663	302218	274937	23	22
664	302241	275031	22	22
665	302192	274991	22	22
666	302185	275005	22	22
667	302162	274974	22	22
668	302148	274978	22	22
669	302150	274913	23	22
670	302154	274882	23	22
671	303589	273856	33	32
672	303084	273630	31	30
673	303539	274238	31	30
674	303344	274105	31	30
675	303566	273944	32	31
676	303563	273943	32	31
677	303143	273583	32	31
678	302979	273579	31	30
679	302935	273579	31	30
680	302903	273610	31	30
681	302937	273604	31	30
682	303062	273617	31	30
683	303174	273595	32	31
684	303252	273734	32	31
685	303240	273795	32	31
686	303309	273650	32	31
687	303323	273659	32	31
688	303372	273636	33	32

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
689	303408	273711	32	31
690	303426	273712	32	31
691	303360	273776	32	31
692	303371	273784	32	31
693	303379	273778	32	31
694	303400	273801	32	31
695	303410	273792	32	31
696	303530	273846	32	31
697	303564	273866	32	31
698	303847	273887	33	32
699	303825	273893	33	32
700	303812	273958	33	32
701	304296	273918	34	33
702	304200	273757	35	34
703	304214	273744	35	34
704	304183	273653	35	34
705	304164	273671	35	34
706	304044	273623	35	34
707	304022	273633	35	34
708	304793	274253	34	33
709	304598	274231	33	32
710	304596	274236	33	32
711	304512	274234	33	32
712	304678	274071	34	33
713	303961	274013	33	32
714	303955	274055	33	32
715	303976	274046	33	32
716	303986	274097	33	32
717	304070	274025	33	32
718	304060	274087	33	32
719	304074	274125	33	32
720	304060	274118	33	32
721	304169	274172	33	32
722	304163	274138	33	32
723	304229	274173	33	32
724	304217	274163	33	32
725	304244	274057	34	33
726	304237	274082	33	32
727	304287	274112	33	32
728	304462	274198	33	32
729	304490	274204	33	32
730	304561	274239	33	32
731	304838	274286	34	33

Table A-1
Predicted Sound Level Modeling Results
Vestas V126-3.45

Receptor ID	NAD 1983 State Plane New York West FIPS 3103		L10 Sound Level (dBA)	Leq Sound Level (dBA)
	X [Easting] (m)	Y [Northing] (m)		
732	305074	274244	34	33
733	305560	273641	38	37
734	305097	274231	34	33
735	304962	274353	33	32
736	304938	274369	33	32
737	304924	274382	33	32
738	307620	273580	36	35
739	307632	273587	36	35
740	307635	273601	36	35
741	307656	273453	36	35
742	307654	273429	37	36
743	307379	273236	39	38
744	307447	273233	39	38
745	306837	273553	39	38
746	305172	273449	39	38
747	304420	273191	39	38
748	303963	273412	36	35
749	304145	273388	37	36
750	304648	273235	40	39
751	304655	273215	40	39
752	304640	273211	40	39
753	304640	273231	40	39
754	303943	273445	35	34
755	304097	273432	36	35
756	304103	273413	36	35
757	304139	273360	37	36
758	304031	273230	37	36
759	304012	273245	37	36
760	304133	273206	38	37
761	304136	273216	38	37
762	304324	273193	39	38
763	304354	273184	39	38
764	303636	273239	35	34
765	302990	273552	31	30
766	303145	273489	32	31
767	303149	273489	32	31
768	303655	273231	35	34
769	303649	273255	35	34

J-2 Technical Memo from Epsilon Associates, Inc.

11-16-16 Response to NYS DPS 03 14 16 comments.docx

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

ASSOCIATES

Dwight R Dunk. LPD
David C. Klinch, PWS, PMP

3 Clock Tower Place, Suite 250
Maynard, MA 01754
www.epsilonassociates.com

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

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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."

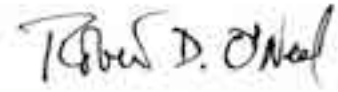
Table 12-1 Modified CNR Adjustments

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

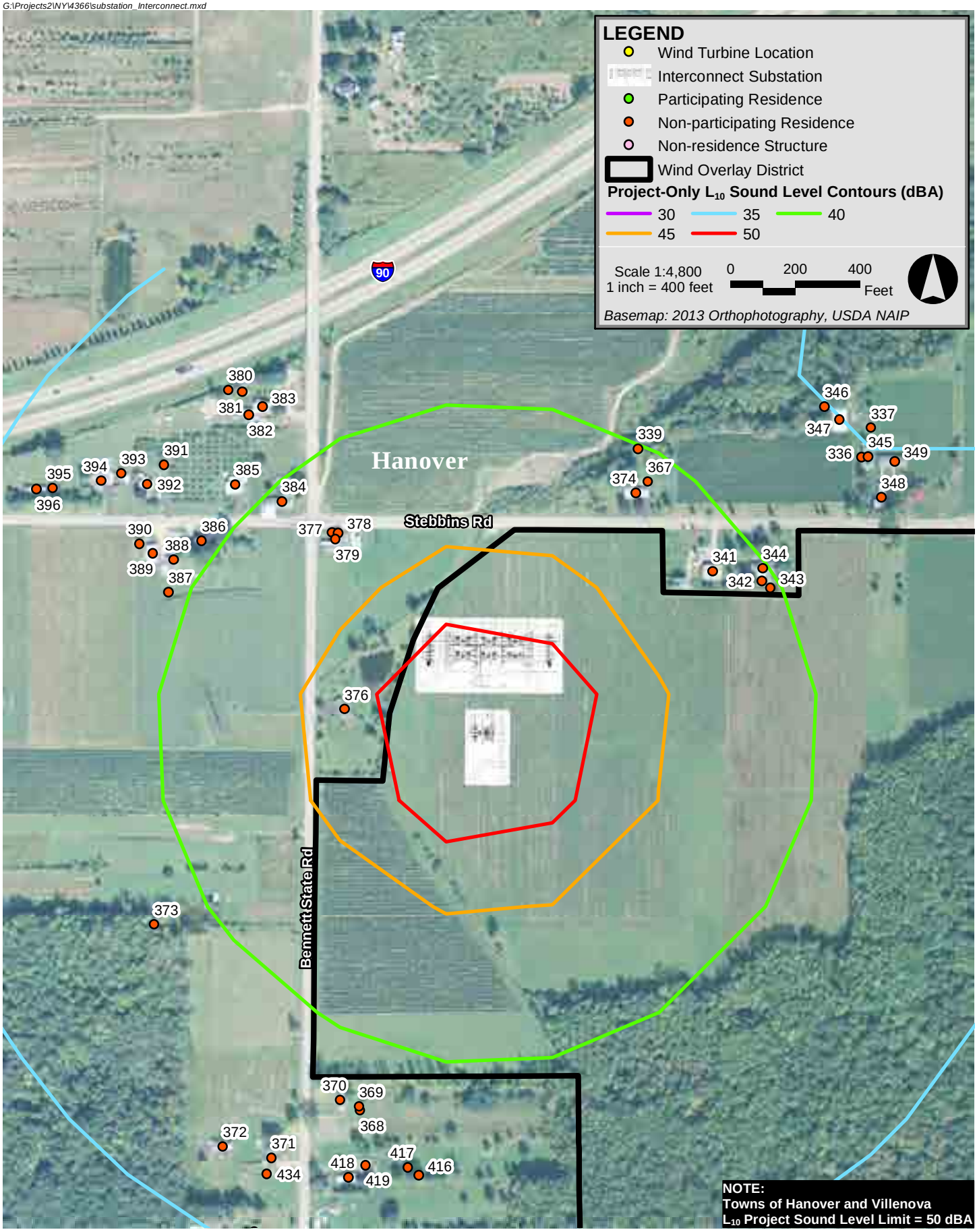
If you have any questions on this matter, please feel free to call me at (978) 461-6236, or e-mail me at roneal@epsilonassociates.com.

Sincerely,

EPSILON ASSOCIATES, INC.



Robert D. O'Neal, CCM, INCE Bd. Cert.
Principal

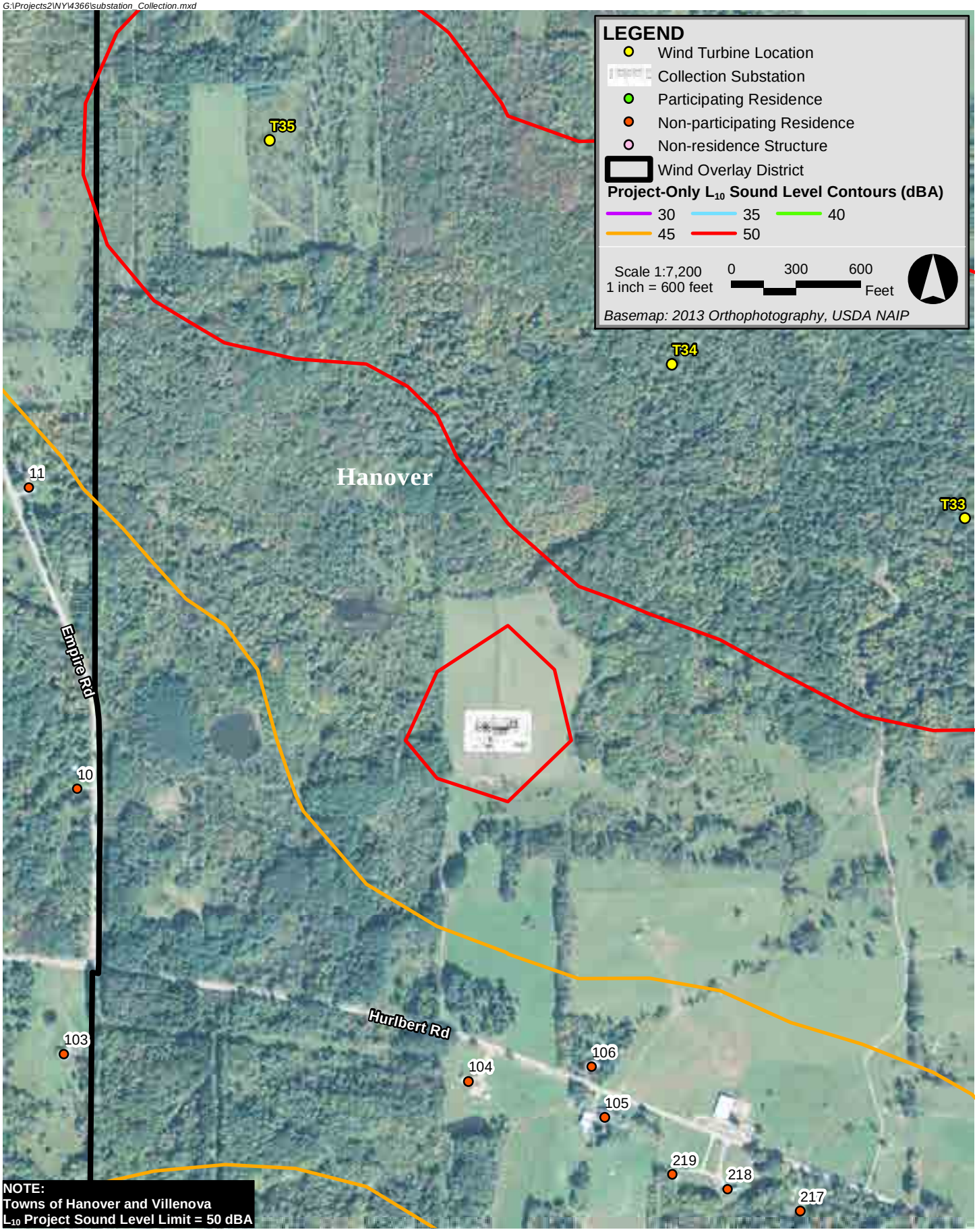


Ball Hill Wind Project Hanover & Villenova, New York

Epsilon

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

Figure 10-1B: Collection Substation

Maximum Project-Only L_{10} Sound Levels
Vestas V126-3.45 MW (11m/s at 87m HH)

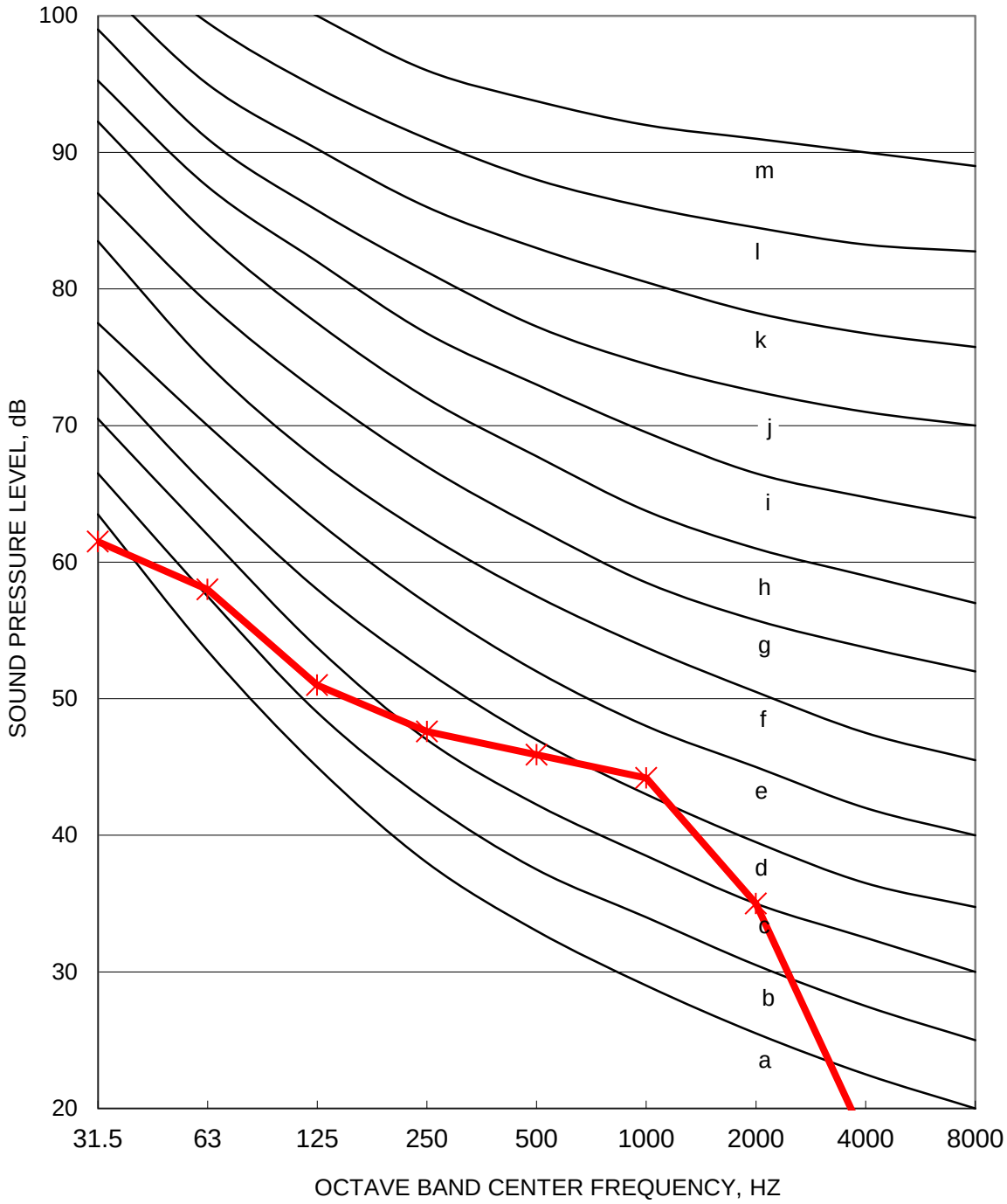


Figure 12-1. Noise Level Rank Curves for Modified CNR Rating Sytem -- Receptor 177

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.

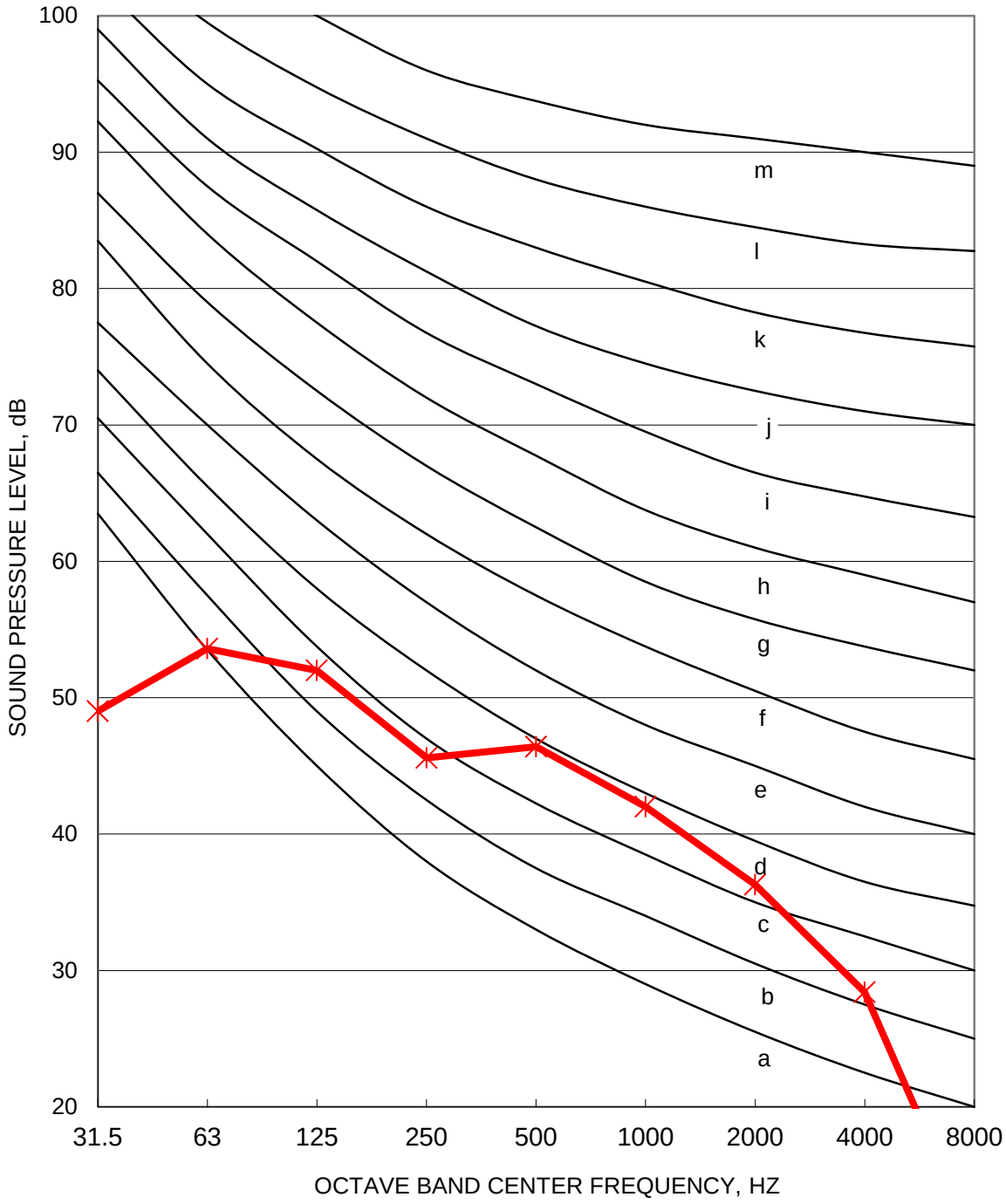


Figure 12-2. Noise Level Rank Curves for Modified CNR Rating Sytem -- Receptor 376

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.

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.

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.

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.

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.

[redacted]

(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.

[redacted]

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.

[redacted]

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.

[redacted]

§ 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.

§ 690.17. Permit Revocation.

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.

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