



**NORTHLAND  
POWER**

# Cochrane Solar Project

## Project Description Report

January 25, 2013



Northland Power Inc.  
on behalf of  
Northland Power Solar  
Cochrane L.P.  
Toronto, Ontario

## Project Description Report

### Cochrane Solar Project

H334844-0000-07-124-0404

Rev. 0

January 25, 2013

#### **Disclaimer**

This report has been prepared by or on behalf of Northland Power Inc. for submission to the Ontario Ministry of the Environment as part of the Renewable Energy Approval process. The content of this report is not intended for the use of, nor is it intended to be relied upon by, any other person. Neither Northland Power Inc. nor any of its directors, officers, employees, agents or consultants has any liability whatsoever for any loss, damage or injury suffered by any third party arising out of, or in connection with, their use of this report.

Project Report

January 25, 2013

**Northland Power Inc.  
Cochrane Solar Project**

**Project Description Report**

**Table of Contents**

<b>1. Introduction .....</b>	<b>3</b>
<b>2. Project Details.....</b>	<b>7</b>
2.1 Energy Sources to Generate Electricity .....	7
2.2 Facilities, Equipment and Technology .....	7
2.3 Class of the Renewable Energy Facility.....	7
2.4 Federal Involvement.....	7
2.5 Project Activities .....	7
2.5.1 Access Road Construction .....	7
2.5.2 Site Preparation .....	8
2.5.3 Installation of Support Structures .....	8
2.5.4 Underground Cable Installation.....	8
2.5.5 Electrical System .....	8
2.5.6 Site Security .....	8
2.5.7 Operation.....	8
2.5.8 Maintenance and Inspection.....	8
2.5.9 Decommissioning .....	9
2.6 Authorizations Required.....	9
2.7 Nameplate Capacity.....	9
2.8 Ownership of the Land.....	9
2.9 Potential Negative Environmental Effects.....	10
2.10 Project Location Map .....	10

### List of Tables

Table 2.1 Potential Negative Environmental Effects ..... 11

### List of Figures

Figure 1 Project Location ..... 5

## 1. Introduction

Northland Power Solar Abitibi L.P., Northland Power Solar Empire L.P., and Northland Power Solar Martin's Meadows L.P. (hereinafter collectively referred to as "Northland") are proposing to develop a 30-megawatt (MW) AC solar photovoltaic project titled the "Cochrane Solar Project" (hereinafter referred to as the "Project"). The Project will be developed on three separate properties (Abitibi, Empire and Martin's Meadows), each with a maximum nameplate capacity of 10-MW AC, and each with a separate OPA FIT contract.

A 21-km long 115-kV transmission line and associated infrastructure is proposed to connect the Project to an existing 115-kV Hydro One Networks Inc. (HONI) transmission line (circuit C2H) north of Hunta, ON.

The Project was formerly submitted to the MOE as three, individual 10-MW projects known as the Abitibi Solar Project, the Empire Solar Project and the Martin's Meadows Solar Project. As the three developments are in close proximity to one another and connect to a common transmission line, they are being integrated as one Project as per Section 4(3) of Ontario Regulation 359/09.

The Abitibi and the Martin's Meadows properties are located on Glackmeyer Concession Road 8/9, in the Town of Cochrane. The Empire property is located on Glackmeyer Concession Road 6/7, in the Town of Cochrane. The 115-kV transmission line will be located primarily along opened and unopened road allowances associated with Concession 8/9 from the locations of the three solar development properties in the Town of Cochrane, through the Unorganized Township of Clute, to the connection point located north of Hunta, ON in the Unorganized Township of Calder. Some private land outside of the road allowances will be used for the transmission line, primarily associated with the movement of the line around the southern end of Lower Deception Lake, as well as for the associated infrastructure (such as transition structures and switching station).

The Project will use solar photovoltaic technology to generate electricity. Each of the three solar developments will use solar modules mounted on fixed steel supports and arranged in seven "power or inverter blocks" on each property. Each inverter block will have two inverters rated at 0.714 MW AC and one transformer. Northland will continue to consider mounting solar modules onto a solar tracking support system, however this report has been prepared assuming the use of a fixed steel support structure with modules at a fixed tilt. Electricity generated by the solar photovoltaic modules from the solar arrays will be converted from direct current (DC) to alternating current (AC) by an inverter, and subsequently stepped up from a medium voltage of 27.6 kV to 115 kV, in order to connect to the HONI transmission system via the previously described transmission line.

Northland is the proponent of the Project. The contact information is as follows:

Rob Miller, Manager, Solar Development  
Northland Power Inc.  
30 St. Clair Ave. West, 17th Floor  
Toronto, ON M4V 3A1

Tel: 647-288-1066  
Fax: 416-962-6266  
Email: [rob.miller@northlandpower.ca](mailto:rob.miller@northlandpower.ca)

Northland has retained Hatch Ltd. (Hatch) to assist Northland in meeting the REA requirements. Contact information for Hatch is as follows:

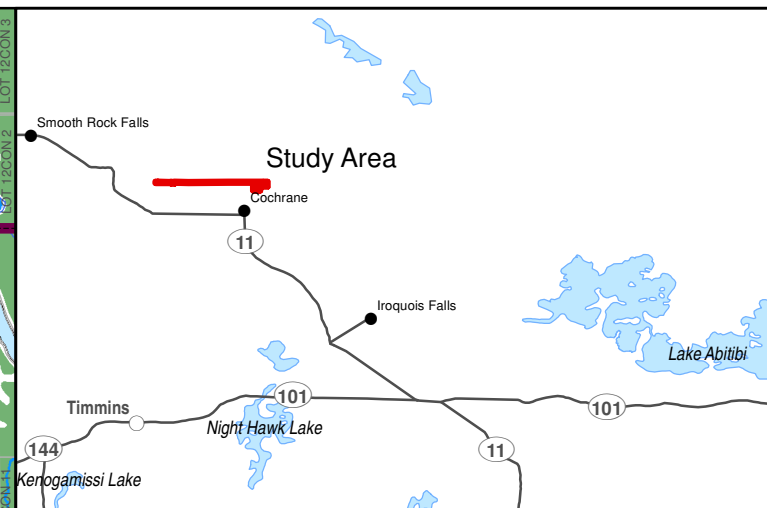
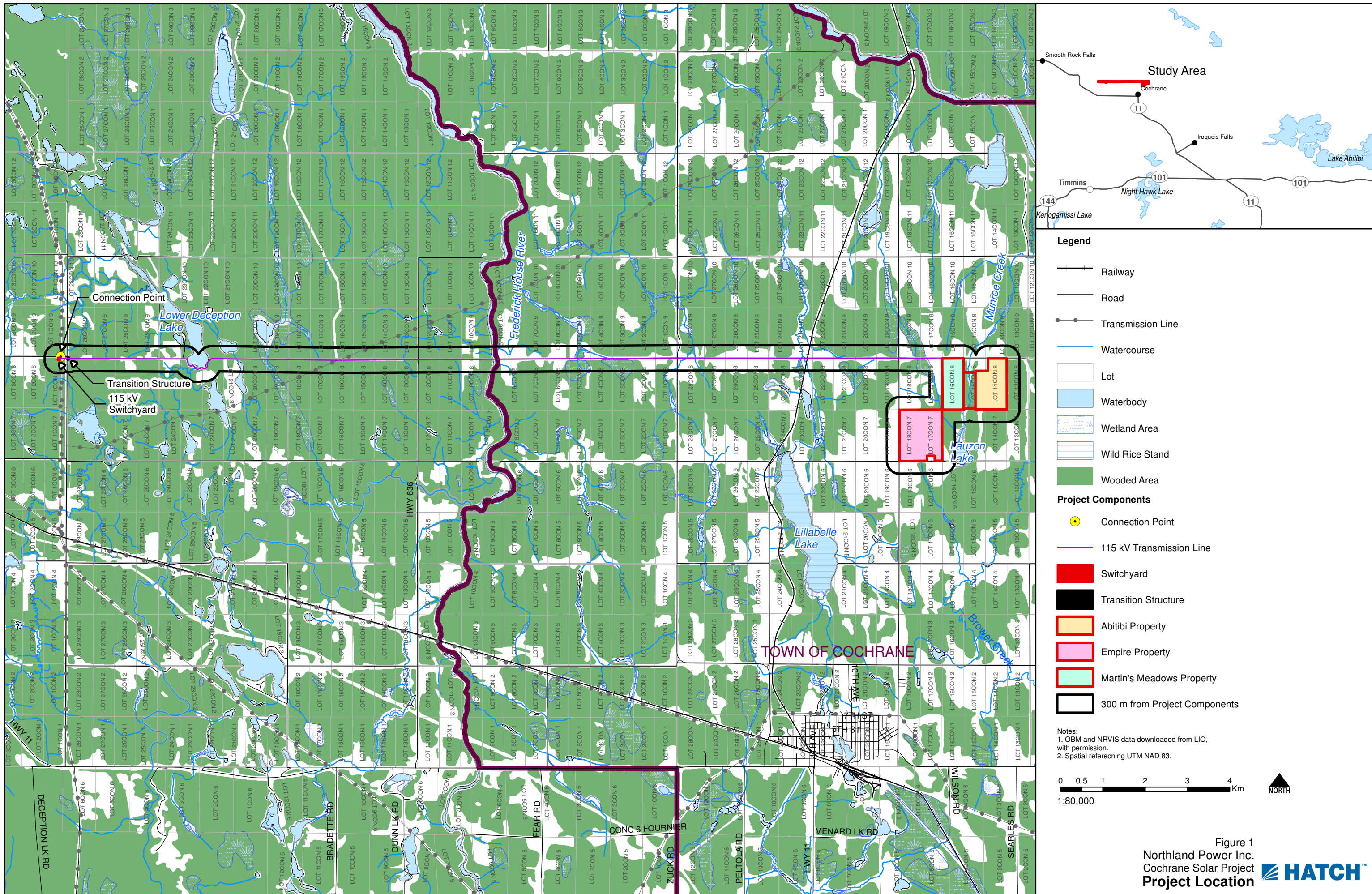
Sean Male  
REA Coordinator, Environmental Assessment & Management  
4342 Queen Street, Suite 500  
Niagara Falls, ON L2E 7J7

Tel: 905-374-0701, Ext. 5280  
Fax: 905-374-1157  
Email: [smale@hatch.ca](mailto:smale@hatch.ca)

The Project Description Report is the first step in the REA process. As required, Northland will complete the requirements for obtaining the REA as identified in O. Reg. 359/09.

Northland has obtained three Feed-In-Tariff (FIT) contracts with the Ontario Power Authority (OPA) for each 10 MW development. The commissioning date for the Project is expected to be achieved in spring 2014.





- Legend**
- Railway
  - Road
  - Transmission Line
  - Watercourse
  - Lot
  - Waterbody
  - Wetland Area
  - Wild Rice Stand
  - Wooded Area
- Project Components**
- Connection Point
  - 115 kV Transmission Line
  - Switchyard
  - Transition Structure
  - Abitibi Property
  - Empire Property
  - Martin's Meadows Property
  - 300 m from Project Components

Notes:  
 1. OBM and NRVS data downloaded from LIO, with permission.  
 2. Spatial referencing UTM NAD 83.

0 0.5 1 2 3 4 Km

1:80,000

NORTH

Figure 1  
 Northland Power Inc.  
 Cochrane Solar Project  
 Project Location **HATCH**

Back of Figure



## 2. Project Details

The following sections are intended to satisfy the requirements of Table 1 to O. Reg. 359/09: Section 10 – Project Description Report which directs the proponent to provide a description of the Project. Further details on the design of the Project will be provided in subsequent required reports as per O. Reg. 359/09, including the Construction Plan Report, Design and Operations Report and the Decommissioning Plan Report.

### 2.1 Energy Sources to Generate Electricity

Solar energy will be used to generate electricity.

### 2.2 Facilities, Equipment and Technology

The proposed Project is a renewable energy generation facility which will use solar photovoltaic technology. Electricity generated by solar photovoltaic panels will be converted from DC to AC by an inverter, and subsequently stepped up (via transformer) to 115 kV prior to being connected to the transmission system. In order to meet OPA's FIT Program requirements, a specific percentage of equipment will be manufactured in Ontario.

At this time the solar module information, including make, model, size, dimensions, number of modules, etc has not been finalized and is subject to change. Northland is considering using a 290 to 320-W module manufactured by MEMC. It is estimated that between 135,000 to 165,000 solar panels will be installed and approximately 42 inverters will be required.

### 2.3 Class of the Renewable Energy Facility

The Project will be a Class 3 solar facility. That is, the Project is ground mounted and greater than 10 kW.

### 2.4 Federal Involvement

No Federal lands or resources will be utilized for the Project and based on the resources within the Project area, issues under Federal jurisdiction are not anticipated. Therefore, no Federal involvement (including permits and approvals) is required.

### 2.5 Project Activities

The Project activities involved in the construction, operation and decommissioning phases of the Project are outlined in the following sections. It is anticipated that the time for construction is 8 to 12 months, depending on time of year and various other factors. Prior to construction, the area will be surveyed. Any buried infrastructure will be located prior to commencing with access road construction and site preparation.

#### 2.5.1 Access Road Construction

New access roads on private land will be required to allow transport of equipment from the main (municipal) road to the Project site. If necessary, the topsoil and subsoil will be removed prior to placement of a granular base. A one-lane, 5-m wide access road will be constructed which will be of sufficient size for the transportation of equipment. The minimum thickness of the access road granular base and top course material will be at least 30 cm. Ditches and culverts will be constructed, if necessary, to maintain site drainage. Erosion and sedimentation control measures (e.g., silt fence barriers, rock flow check dams, etc) will be installed if needed. If temporary access roads are to be removed following completion of construction, topsoil will be replaced.

### **2.5.2 Site Preparation**

Where practical, topsoil will be stripped from temporary access road locations and stored adjacent to the roads. Locations of topsoil and subsoil stockpiles will be determined in consultation with the landowner and not within 30 m of a water body. If topsoil is not stripped, the agricultural crops will be left uncut or shredded and left on the soil surface over the entire working area. If necessary to control sediment, erosion and sedimentation control measures will be installed.

### **2.5.3 Installation of Support Structures**

Foundations and/or support structures will be required beneath transformers, inverters and photovoltaic panels. Detailed engineering for the design of the foundations and support structures are to be completed. However, it is expected that the pads for the transformers and inverters will be concrete slab-on-grade. It is also anticipated that drilling will be completed for the purposes of stabilizing the support structures of the photovoltaic arrays. The photovoltaic panels will be installed on fixed racking structures. Foundation construction and the installation of support structures will be subject to inspection prior to the installation of photovoltaic modules, and wiring.

### **2.5.4 Underground Cable Installation**

DC wiring will run along the structural supports of the photovoltaic arrays. A network of underground DC cabling will be required at the termination point of the photovoltaic arrays to centrally located inverters which will then convert the electricity to AC. A simple trenching device will be used to install the cables, whereby a slot is opened, the cable laid, and the soil replaced.

### **2.5.5 Electrical System**

Underground lines will be buried and convey the electricity from the inverters to a 27.6-kV substation to be located on each of the properties, from which a single feeder line (overhead or underground) will run to the 115-kV transformer substation on the Martin's Meadow property. The transformer will step up the voltage to 115 kV, and a 21-km overhead transmission line will run in a westerly direction along Concession 8/9 to the 115-kV connection point north of Hunta, ON. The transmission line will be owned and maintained by Northland Power Inc., and will be constructed using new wooden poles and/or steel towers.

### **2.5.6 Site Security**

The Project will be gated and fenced, with additional security measures installed as deemed necessary by Northland. This will include security cameras and motion sensor flood lighting.

### **2.5.7 Operation**

The Project will operate year round and generate electricity during daylight hours. The amount of power generated will depend on daily weather conditions and sufficient solar irradiation. The Project will be operated remotely and therefore no employees will be on site with the exception of maintenance and inspections.

### **2.5.8 Maintenance and Inspection**

The Project will typically be scheduled for maintenance every 2 to 3 months. Typically, maintenance includes checking the structures, interconnections and cleaning the photovoltaic panels. It is anticipated that the panels will be washed twice a year using on-site water with no cleaning solutions. All the required maintenance materials (e.g., hydraulic fluids) will be brought to the site as required so no on-site storage of this material will be necessary. The Project will also be

inspected whenever the power output is lower than anticipated as this would be indicative of a mechanical problem.

### 2.5.9 Decommissioning

A 35 to 40-yr lifespan is typically anticipated for the Project. At that time (or earlier if the power purchase agreements are not extended), the Project will be decommissioned or refurbished depending on market conditions and/or technological changes.

If the decision is to discontinue renewable energy generation, the process would involve the following:

- Removal of the scrap metal and cabling. Where possible, these materials will be recycled, with non-recyclables taken to an approved disposal site.
- Removal of support structures and foundations unless the landowner requests otherwise. These materials will be recycled where possible.
- Site cleanup and regrading to original contours, and any damage to tile drainage system to be repaired/replaced.
- Planting of leguminous crops to provide a rapid return of nutrients and soil structure.

Once the Project, other materials, and road network are removed from the site, the fields will be returned to their condition prior to the project at the discretion of the landowner.

## 2.6 Authorizations Required

Permits, licenses and authorizations such as those listed below, in addition to the REA may be required for the Project to proceed:

- Building Permit – The local municipality will likely require a building permit to undertake construction.
- Ministry of Natural Resources (MNR) Work Permit and/or *Lakes and Rivers Improvement Act* Approval – MNR approval will be required should a water crossing be required for the Project.

## 2.7 Nameplate Capacity

The nameplate capacity of the Project is planned to be 30 MW.

## 2.8 Ownership of the Land

The solar panels and associated equipment for the Project will be located on privately owned lands, located on Lots 14, 15, 16, Concession 8, and Lots 17, 18, Concession 7, in the Town of Cochrane. The proponent has entered into an option to purchase agreement with the landowners. In total, the land for the three developments is approximately 301.99 ha. The longitude and latitude are 49.140073 N and -80.971227 W for the Abitibi property; 49.127954°N and -80.994305°W for the Empire property; and 49.141101 N and -80.984888 W for the Martin's Meadows property.

The 115-kV transmission line will be located primarily along opened and unopened road allowances associated with Concession 8/9 from the locations of the three solar development properties in the Town of Cochrane, through the Unorganized Township of Clute, to the connection point located north of Hunta, ON in the Unorganized Township of Calder.

Road allowances in the Town of Cochrane are under municipal control, while road allowances in the unorganized Township are considered to be Crown Land under the control of the Ontario Ministry of Natural Resources. Some private land outside of the road allowances will be used for the transmission line, primarily associated with the movement of the line around the southern end of Lower Deception Lake, as well as for the associated infrastructure (such as the transition structure and switching station).

## **2.9 Potential Negative Environmental Effects**

Negative environmental effects may occur as a result of construction and operation of the Project. The environmental components and the potential environmental effect of the Project on the environmental components are provided in Table 2.1. An Environmental Constraints Assessment was completed which determined where the natural heritage features, waterbodies, wetlands (including Provincially Significant Wetlands), quarries/pits, Areas of Natural and Scientific Interest (ANSIs), etc, are located. Therefore, the potential negative environmental impacts to these have been included.

The other environmental components (i.e., not related to natural heritage features and waterbodies) have also been included in Table 2.1. However, since these environmental components have not been researched and field studies and impact assessments have not been completed, these potential impacts provided are generic to some solar projects and will not necessarily be realized on this Project.

Based on the current knowledge of the site and standard/regulated environmental protection practices, preliminary proposed mitigation measures have been provided. Confirmation of these and further details will be provided in subsequent reports (e.g., Construction Plan Report, Design and Operations Report and Environmental Impact Studies). In addition, the residual effect after the implementation of the mitigation measures has also been provided.

As part of the REA process for the Project, if environmental features are determined to be significant and within required setbacks from the Project, an Environmental Impact Study (EIS) will be prepared. It is anticipated the EIS will determine the impacts to these features and mitigation measures will be developed to minimize or eliminate negative effects. In addition, if any waterbodies are within the specified setbacks, an EIS will also be prepared.

## **2.10 Project Location Map**

As required in Table 1 of O. Reg. 359/09, an unbound, legible and reproducible project location map on a 215 x 280-mm page showing land within 300 m of the project location is enclosed.

**Table 2.1 Potential Negative Environmental Effects**

Environmental Component		Potential Environmental Effect	Proposed Mitigation	Residual Effect
Natural Environment	Physiography/ Topography	During construction, regrading of excavated soils and some minor alterations to local topography may occur.	Decommissioning of the Project site will include regrading to original conditions, to the extent possible.	No residual effect.
	Soils	Potential reductions in soil quality/loss of soils as a result of accidental spills, erosion, soil compaction during construction.	Erosion sedimentation control measures will limit the impact due to erosion, spill control measures will limit impact on quality of soils, no soil will be removed off site and de-compaction will occur, where necessary.	No residual effect on soil quality/quantity is expected.
	Aggregate Resources	Not applicable.	Not applicable.	Not applicable.
	Surface Water	Surface water quality of the various waterbodies in proximity to the Project location could be impaired due to contamination from accidental spills or increased turbidity due to site erosion.	A 30-m setback for electrical equipment will be put in place from all waterbodies in accordance with provincial requirements and regulations. As well, erosion and sedimentation control measures and spill prevention and response measures will decrease any further impacts. Where required, water crossings will be construction in accordance with best management practices.	No residual effect in surface water quality is expected.
	Groundwater	Excavations may result in a minor decrease in the local availability of groundwater due to dewatering. In addition, groundwater may also be impaired by contamination due to accidental spills, or changes in ground water recharge.	Groundwater withdrawals are to be minimized to limit changes in groundwater availability, in accordance with provincial requirements. Spill response measures will prevent any accidental spills.	No residual effect is expected for groundwater.
	Aquatic Habitats/Biota	The installation of the Project may result in negative impacts to fish and fish habitat, if watercourse crossings are required.	A 30-m setback for electrical equipment from all water courses will protect fish habitat, in accordance with provincial requirements and regulations. Erosion and sedimentation controls and spill prevention and response measures will limit any potential impact. Where required, water crossings will be construction in accordance	No residual effect is expected for aquatic habitats/biota.



Environmental Component	Potential Environmental Effect	Proposed Mitigation	Residual Effect	
		with best management practices.		
	Areas of Natural and Scientific Interest (ANSI)	Not applicable as there are no ANSI identified within 300 m of the Project site.	Not applicable.	Not applicable.
	Wetlands	There are wetlands located within 120 m of the Project site.	Mitigation measures proposed in the EIS and monitoring of effects will occur, throughout the life of the Project, to limit any detrimental impacts on any significant wetlands.	No residual effects are expected upon implementation of mitigation measures.
	Vegetation	Vegetation clearing on agricultural land as well as within natural vegetation communities will be required.	Work areas will be flagged to limit the clearing, so it will not extend into un-utilized areas. Revegetation, as required, will occur after decommissioning.	Loss of some vegetation on site.
	Terrestrial Wildlife/ Wildlife Habitat (including species at risk)	Potential loss of wildlife habitat and potential wildlife avoidance of the Project area during construction and operation may occur as a result of disturbance.	Work areas will be clearly marked and will not infringe further than necessary. Mitigation measures will include no clearing in bird breeding season, if required. Area under panels will be seeded to support local wildlife communities.	Reduced wildlife habitat during the life of the Project can be expected; however, re-establishment will occur after decommissioning.
	Air Quality	Reductions in local air quality from operation of construction equipment and dust displacement may occur due to vehicle traffic.	Through the use of standard best management practices and mitigation measures dust and emissions will be suppressed to maintain good air quality during construction, in accordance with provincial requirements and regulations.	No residual effects anticipated to air quality.
<b>Social Environment</b>	Land Use	Current land use will be discontinued within the Project footprint.	None; however, area under panels will be seeded to support local wildlife communities.	During the lifetime of the Project, the land use will be changed. After decommissioning, there is a potential for the land to revert back to the past use.
	Tourism and Recreation	Any tourism or recreational resources existing within the immediate Project vicinity will be considered in determining potential impacts.	Visual screening in those areas will be considered, if required.	No residual effects are expected.

Environmental Component		Potential Environmental Effect	Proposed Mitigation	Residual Effect
	Archaeological and Cultural Heritage Resources	Archaeological assessments will be conducted prior to construction to determine if archaeological resources are found on the property. Excavations during Project construction may result in the discovery of archaeological resources. Potential heritage resources will be determined as per the requirements of the Ministry of Tourism and Culture.	During construction if an artefact is found, work will stop until a licensed archaeologist has cleared the area and construction can recommence, in accordance with Ministry of Tourism and Culture requirements.	No residual effects are expected.
	Sound Levels	Temporary disturbance to neighbouring residents may occur during construction. The operation of inverters and transformers may result in increased ambient sound levels. However, noise studies in accordance with O. Reg. 359/09 are required to meet sound levels established by the Ministry of the Environment (MOE).	Measures to meet MOE sound levels for the closest receptor during operations will be implemented, as required.	No residual effect is expected for sound levels.
	Visual Landscape	Installation of the Project will result in a change to the local landscape.	Visual barrier may be installed, where necessary, if this is determined to be effective and viable.	Depending on if a barrier will assist in screening the Project, no residual effects are anticipated.
	Community Safety	Construction of the Project will result in a risk to community and workforce safety. During operation, potential risks to public safety are limited.	Safety procedures will be followed to ensure both worker and public safety. The public will not be allowed access to the site during construction, operations or decommissioning.	No residual effect is expected in response to community safety.
	Local Traffic	Construction of the Project may result in increased local area traffic and temporary disruption along routes used resulting in delays to the local community traffic, and increased traffic as a result of equipment delivery to the Project site.	Transportation routes will be determined to minimize the impact on local traffic.	During construction, there will be a temporary increase in construction vehicles. Otherwise, no residual effect is expected.
	Waste Management and Disposal Sites	Construction and operation of the Project will likely result in the generation of recyclable material, and municipal and sanitary waste.	The disposal and proper storage of wastes and recyclables will occur in accordance with municipal and provincial requirements and regulations.	No residual effect is expected.

