



**NORTHLAND
POWER**

Belleville South Solar Project

Project Description Report

August 15, 2011



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

Project Description Report

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H334844-0000-07-124-0003

Rev. 1

August 15, 2011

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Table of Contents

1. Introduction 3

2. Project Details..... 4

2.1 Energy Sources to Generate Electricity 4

2.2 Facilities, Equipment and Technology 4

2.3 Class of the Renewable Energy Facility..... 4

2.4 Federal Involvement..... 4

2.5 Project Activities 4

2.5.1 Access Road Construction 4

2.5.2 Site Preparation 5

2.5.3 Installation of Support Structures 5

2.5.4 Underground Cable Installation..... 5

2.5.5 Distribution Line Erection..... 5

2.5.6 Site Security 5

2.5.7 Operation..... 5

2.5.8 Maintenance and Inspection..... 6

2.5.9 Decommissioning 6

2.6 Authorizations Required..... 6

2.7 Nameplate Capacity..... 6

2.8 Ownership of the Land..... 7

2.9 Potential Negative Environmental Effects..... 7

2.10 Project Location Map 7

Project Location Map

1. Introduction

Northland Power Inc. on behalf of Northland Power Solar Belleville South L.P. (hereinafter referred to as “Northland”) is proposing to develop a 10-MW solar photovoltaic project titled Northland Power Solar Belleville South (hereinafter referred to as the “Project”). As required, Northland is commencing with the Renewable Energy Approval (REA) process as required and described in Ontario Regulation 359/09 under the *Environmental Protection Act*. This Project Description Report has been prepared in accordance with O. Reg. 359/09.

The Project is located within the City of Prince Edward County, a single tier municipality.

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

Tom Hockin
Development Manager - Renewables
Northland Power Inc.
30 St. Clair Ave. West, 17th Floor
Toronto, ON
M4V 3A1

Tel: 647-288-1046, Ext. 138
Fax: 416-962-6266
Email: Tom.Hockin@northlandpower.ca

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

Kimberley Arnold
Manager – Environmental Services, Renewable Power
4342 Queen Street, Suite 500
Niagara Falls, ON
L2E 7J7

Tel: 905-374-0701, Ext. 5318
Fax: 905-374-1157
Email: karnold@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 applied for a Feed-In-Tariff (FIT) contract with the Ontario Power Authority (OPA). In the application for the FIT contract, a proposed commissioning date is required. The commissioning date for the Project is dependent on the timing of a Contract Offer from the OPA, but is expected to be achieved by the end of 2011.

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 44 kV prior to being connected to the distribution line. 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 determined. It is estimated that between 45,000 to 55,000 solar panels will be installed and approximately 20 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 4 to 8 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 Distribution Line Erection

An underground distribution line, will be constructed which transports the electricity from the inverters to the transformer. The transformer will step up the voltage, and a distribution connection from the transformer will be erected to transport the generated power from the Project to the 44-kV connection point. The connection point and feeder line are owned by Hydro One Networks Inc. (HONI) which is the local distribution company. The distribution line from the Project to the connection point will be along municipal road right-of-ways. New wooden poles (or existing poles) will be used.

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.
- Conservation Authority Permit – Approval from the local Conservation Authority may be required should development occur within the Conservation Authority's Regulated Area.
- 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 will be up to 10 MW.

2.8 Ownership of the Land

The Project will be located on privately owned lands. The proponent has entered into a lease agreement with the landowner for the duration of facility operation. The leased land is approximately 40 ha and zoned rural and environmental protection. The longitude and latitude are 44.067229 and -77.315363, respectively.

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. We have completed an Environmental Constraints Assessment 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 the 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 and required clean will limit impact on quality of soils, no soil will be removed 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 Consecon Creek could be impaired due to contamination from accidental spills or increased turbidity due to site erosion.	A 30-m setback will be put in place from all water bodies 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.	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 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.	No residual effect is expected for aquatic habitats/biota.
	Areas of Natural and Scientific Interest (ANSI)	Not applicable as there are no ANSI identified within 120 m of the Project site.	Not applicable	Not applicable

Environmental Component	Potential Environmental Effect	Proposed Mitigation	Residual Effect
Wetlands	The locally significant Consecon Creek Wetland is located within 120 m of the Project site.	Mitigation measures proposed in the EIS and monitoring of effects will occur. This would include erosion and sedimentation control measures.	No residual effect to the wetlands is anticipated.
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. At least a 30-m buffer for Consecon Creek will be retained.
Woodlands	There are numerous woodlands located on and within 120 m of the Project site. If these woodlands are considered to be significant, then an EIS will be conducted. Clearing of the woodlands on the Project site may be required. Woodlands adjacent to the Project site may be indirectly affected by Project activities, such as the generation of dust during construction which could impact vegetation communities.	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 woodlands. Dust control measures will be implemented. Revegetation, as required, will occur after decommissioning.	Loss of some vegetation during life of Project; however, regeneration will occur after decommissioning.
Valleylands	Not applicable as there are no valleylands identified within 120 m of the Project site.	Not applicable	Not applicable
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.

Environmental Component		Potential Environmental Effect	Proposed Mitigation	Residual Effect
Social Environment	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.
	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 re-commence, 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 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.

Environmental Component		Potential Environmental Effect	Proposed Mitigation	Residual Effect
	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.



