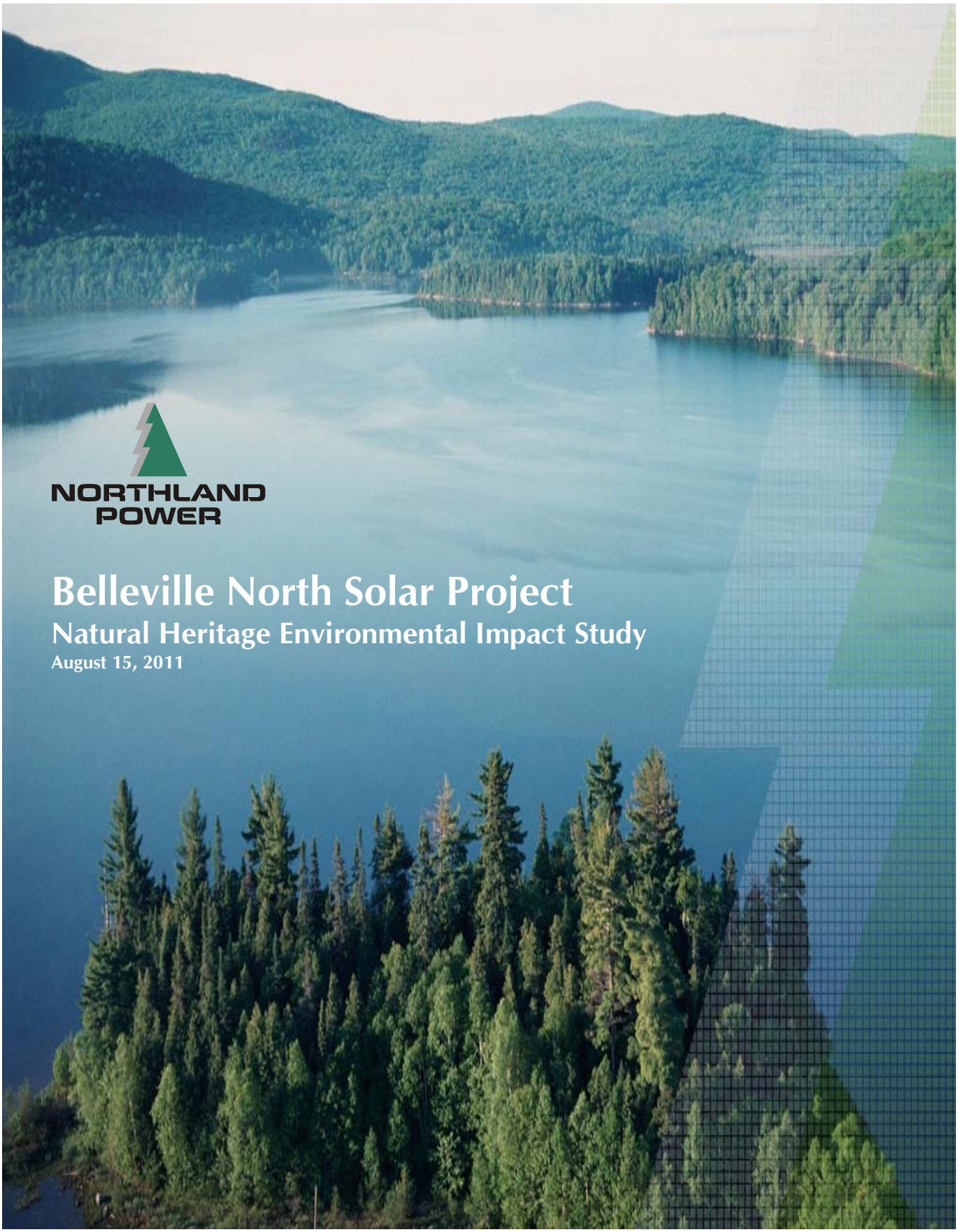

NORTHLAND POWER

Belleville North Solar Project

Natural Heritage Environmental Impact Study

August 15, 2011

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

Natural Heritage Environmental Impact Study

Belleville North Solar Project

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August 15, 2011

Project Report

August 15, 2011

Northland Power Inc.
Belleville North Solar Project

Natural Heritage Environmental Impact Study

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1. Introduction

Northland Power Solar Belleville North L.P. (hereinafter referred to as "Northland") is proposing to develop a 10-megawattt (MW) solar photovoltaic (PV) Project titled Belleville North Solar Project (hereinafter referred to as the "Project"). The Project will be located on approximately 40 hectares (ha) of land, located at Lot 65 of Concession V Bay Side in the single-tier municipality of the Corporation of the County of Prince Edward.

As stated in Sections 37 and 38 of Ontario Regulation (O. Reg.) 359/09 *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the "REA Regulation"), an Environmental Impact Study (EIS) is required for all significant natural heritage features determined to be within a specified setback in order to obtain a Renewable Energy Approval (REA). The EIS identifies the potential negative environmental effects, documents the proposed mitigation measures, and describes the environmental effects monitoring plan for the natural heritage features.

1.1 Renewable Energy Approval Legislative Requirements

Per Section 4 of the REA Regulation, ground-mounted solar facilities with a name plate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities and require a REA.

The REA process requires the preparation of several reports with respect to natural heritage features on and within 120 m of the Project location, including the Records Review Report, Site Investigation Report, Evaluation of Significance (EOS), and if necessary, the EIS. The legislative requirements for these reports are summarized in the following sections.

1.1.1 Records Review Report

Section 35 of the REA Regulation requires proponents of Class 3 solar projects to undertake a natural heritage records review to identify "whether the project is

1. in a natural feature
2. within 50 m of an area of natural and scientific interest (earth science)
3. within 120 m of a natural feature that is not an area of natural or scientific interest (earth science)." (O. Reg. 359/09, s. 25, Table).

Natural Features are defined in Section 1 (1) of the REA Regulation to be all or part of

a) an area of natural and scientific interest (ANSI) (earth science)

b) an ANSI (life science)

c) a coastal wetland

d) a northern wetland

e) a southern wetland

f) a valleyland

g) a wildlife habitat, or

h) a woodland.

Subsection 2 of Section 30 of the REA Regulation requires the proponent to prepare a report "setting out a summary of the records searched and the results of the analysis" (O. Reg. 359/09). The Natural Heritage Records Review Report (Hatch Ltd., 2010a) was prepared to meet these requirements.

1.1.2 Site Investigation Report

Section 26 of the REA Regulation requires proponents of Class 3 solar projects to undertake a natural heritage site investigation for the purpose of determining

- whether the results of the analysis summarized in the (natural heritage records review) report prepared under Subsection 25(3) are correct or require correction, and identifying any required corrections
- whether any additional natural features exist, other than those that were identified in the (natural heritage records review) report prepared under Subsection 30(2)
- the boundaries, located within 120 m of the Project location, of any natural feature that was identified in the records review or the site investigation
- the distance from the Project location to the boundaries determined under clause (c).

The Natural Heritage Site Investigation Report (Hatch Ltd., 2010b) was prepared to meet these requirements.

1.1.3 Evaluation of Significance Report

Section 27 of the REA Regulation requires proponents of Class 3 solar projects to undertake an evaluation of significance (EOS) for natural heritage features identified during the records review, site investigation, and public, aboriginal and municipal consultation activities within 120 m of the Project location (with the exception of ANSI, earth science which must be within 50 m of the Project location).

Natural features can be identified as significant or provincially significant as a result of previous identification by the Ministry of Natural Resources (MNR), or that is determined to be significant or provincially significant based on an evaluation completed according to evaluation criteria or procedures established or accepted by the MNR.

The EOS Report sets out

- a determination of whether the natural feature is
  - provincially significant/not provincially significant (in respect of wetlands and ANSIs)
  - significant/not significant (in respect of wildlife habitat, woodlands, and valleylands)
- a summary of the evaluation criteria or procedures used to make the determinations
- the name and qualifications of any person who applied to evaluation criteria or procedures
- the dates of the beginning and completion of the evaluation.

The EOS Report (Hatch Ltd., 2010c) for the natural features identified within 120 m of the Project was prepared to meet these requirements.

1.1.4 Environmental Impact Study Report

Section 38(1) of the REA Regulation prohibits the construction, installation or expansion of any component of a solar Project within the following locations:

- a provincially significant northern wetland or within 120 m of a provincially significant northern wetland
- within 120 m of a provincially significant southern wetland
- within 120 m of a provincially significant coastal wetland
- a provincially significant area of natural and scientific interest (ANSI) (earth science) or within 50 m of a provincially significant ANSI (earth science)
- a provincially significant ANSI (life science) or within 120 m of a provincially significant ANSI (life science)
- a significant valleyland or within 120 m of a significant valleyland
- a significant woodland or within 120 m of a significant woodland
- a significant wildlife habitat or within 120 m of a significant wildlife habitat
- within 120 m of a provincial park
- within 120 m of a conservation reserve.

However, Section 38(2) allows proponents to construct within the locations noted above, subject to the completion of an EIS to assess negative effects and evaluate appropriate mitigation and monitoring measures.

Section 38(2) of the REA Regulation indicate that the EIS report must

- identify and assess any negative environmental effects of the projects on natural features, provincial parks or conservation reserves referred to in Section 38.(1)
- identify mitigation measures in respect of any negative environmental effects
- describe how the environmental effects monitoring plan in the Design and Operations Report (Hatch Ltd., 2010e) addresses any negative environmental effects
- describe how the Construction Plan Report (Hatch Ltd., 2010d) addresses any negative environmental effects.

This EIS has been prepared to address these requirements for the construction of Project components within 120 m of natural heritage features noted in Section 1.1.

1.2 Background Information on Natural Heritage Features

The Natural Heritage Records Review (Hatch Ltd., 2010a) and Natural Heritage Site Investigations Report (Hatch Ltd., 2010b) confirmed that the Project will be constructed within 120 m of several

natural features. Of these natural features, several were identified as significant natural heritage features during the EOS (Hatch Ltd., 2010c).

The natural heritage features that are classified as significant are

- woodland 4, within 120 m east of the Project location
- wildlife habitat found on and within 120 m of the Project location in
  - the watercourses and associated meadow marsh and marsh habitats within 120 m south of the Project location as an amphibian movement corridor, amphibian breeding habitat (wetland), and Northern Ribbonsnake habitat
  - the wetland south of the Project location as western chorus frog habitat
  - agricultural lands and hedgerow on and within 120 m of the Project location as foraging habitat and movement corridor, respectively, for species of conservation concern (milksnake).
  - Stick nest and 200 m around the nest as significant raptor nesting habitat

These significant natural heritage features and their locations in relation to the Project location are shown in Figure 1.1.

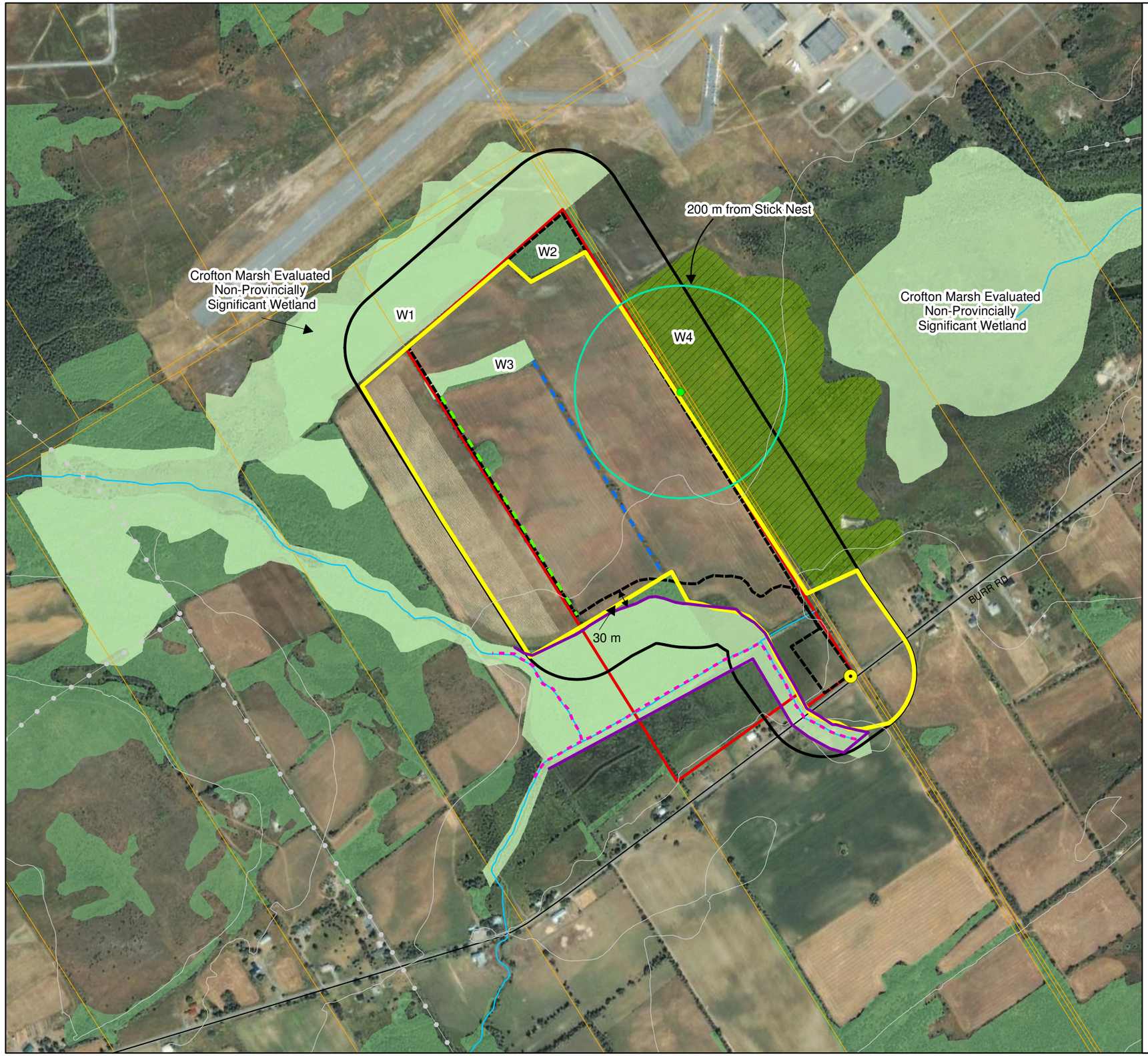
1.3 Environmental Impact Study Format

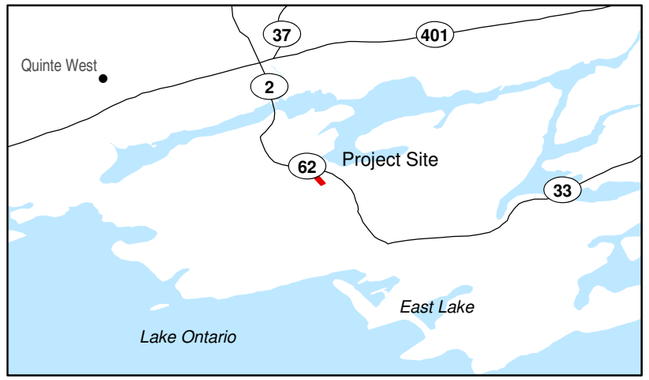
Section 1 of this EIS has identified the legislative requirements for an EIS under the REA Regulation and identified the reasons why an EIS is required for the Project. Section 2 provides the methodology of the EIS. Section 3 summarizes the activities associated with Project construction, operation and decommissioning, as described in the Project Description Report (Hatch Ltd., 2010h). Section 4 identifies and assesses negative environmental effects and the proposed mitigation measures to prevent/minimize the potential effects. Section 5 describes the environmental effects monitoring plan from the Design and Operations Report (Hatch Ltd., 2010e). Section 6 describes how the Construction Plan Report (Hatch Ltd., 2010d) addresses the potential negative environmental effects. Section 7 summarizes the results of the EIS. References are included in Section 8.

2. Methodology

The following steps outline the methodology that was used to prepare this EIS:

1. Documentation of Project components and activities during all Project phases, including construction, operations and decommissioning, including identification of temporal and spatial boundaries.
2. Background data collection on the natural features on and within 120 m of the Project location through the Records Review and Site Investigation processes.
3. Identification of the effects that is likely to occur on the environmental components as result of implementing the Project.





Legend

- Roads
- Transmission Line
- Topographic Contour (5m interval)
- Watercourse
- Available Lands
- 120m From Project Location
- Parcels
- Wetland
- Woodland
- New Hedgerow

Significant Natural Heritage Features

- Milksnake Movement Corridor
- -- Milksnake Foraging Habitat
- -- Western Chorus Frog Habitat
- -- Amphibian Breeding Habitat
- -- Amphibian Movement Corridor
- -- Northern Ribbonsnake Habitat
- Stick Nest
- Raptor Nesting Habitat
- Significant Woodland

Project Components

- Connection Point With Existing Distribution Line
- Project Location

0 75 150 300 Metres

NORTH

1:7,500

Notes:
1. OBM and NRVIS data downloaded from LIO,with permission.
2. Spatial referencing UTM NAD 83.
3. Satellite imagery from Google Earth Pro.

Figure 1.1
Northland Power Inc.
Belleville North Solar Project
Project Location and Significant Natural Heritage Features

HATCH™

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4. Development of mitigation measures to eliminate, alleviate or avoid the identified negative effects.
5. Design of an environmental effects monitoring program to confirm the predicted effects and the effectiveness of mitigation measures.

3. Project Components and Activities

The following sections briefly describe the construction, operation and decommissioning phases of the Project. The information is taken from the Construction Plan Report (Hatch Ltd., 2010d), Design and Operations Report (Hatch Ltd., 2010e) and Decommissioning Plan Report (Hatch Ltd., 2010f).

3.1 Construction

Information presented below is a reproduction from Section 2.1 of the Construction Plan Report (Hatch Ltd., 2010d)

3.1.1 Construction Overview

The site is southeast of Belleville, approximately 40 km south of Highway 401 with access via Burr Road (municipal road) from the south. Appendix A provides the site layout and refers to many of the site facilities and features discussed below.

The construction process of the Project consists of four phases:

- Phase 1 – Site Preparation
- Phase 2 – Construction and Installation of Plant
- Phase 3 – Testing and Commissioning
- Phase 4 – Site Restoration.

The site work is scheduled to start in early summer of 2011 and have an estimated 6 to 8 month construction period. It is anticipated that the operation of the Project (Project life) will be at least 20 years, and potentially up to 50 years.

The timeline and duration of each of the main construction phases is provided in Table 3.1.

Table 3.1 Project Timeline

Activity	Approximate Timeline (2011)	Duration (days)
Installation of Site Access Components	May 1 to July 30	91
Safety and Security	May 1 to December 1	214
Temporary Facilities	May 1 to December 1	214
Power and Communication	May 1 to July 15	75
Site Preparation	May 1 to May 30	30
Foundation	June 1 to June 30	30
Structural Support	July 1 to August 15	45
Solar Modules	August 15 to September 30	45
Electrical Collection System	June 1 to October 30	153
Landscaping, Vegetation and Drainage	October 1 to October 30	30

Information on the construction and installation activities is provided in the following sections.

3.1.2 Construction Methodology

3.1.2.1 Safety Management

Safety is our primary objective with a Project goal to maintain a safe working environment that results in completion of the Project with zero fatalities, zero critical injuries and zero lost time injuries, while maintaining the safety of the public at all times.

The Project will comply with all applicable Ontario Occupational Health and Safety Act requirements during the construction period. A site-specific health and safety plan will be developed and a safety and compliance officer will be assigned to the Project to implement and strictly enforce the plan.

The Contractor is required to provide construction method statements and related Job Safety Assessments (JSA), for review by the Owner's Construction Manager, prior to commencement of work.

3.1.2.2 Workforce

The Project will employ a workforce recruited from within the local area to the greatest extent possible. The workforce will include construction supervision, general and skilled labour, equipment operators, technicians for electrical systems and commissioning, plant installation and operation, security and general maintenance. The construction workforce is estimated to be 50 workers on average for the approximately 6 to 8 month construction period, with a peak of approximately 60 workers.

Construction hours will normally be from 7:00 a.m. to 6:00 p.m., Monday through Friday, in accordance with local municipal by-laws. Occasionally, when work may have to be continued after dusk and on the weekends, the Project will follow the local municipal requirements and minimize impacts to the local community.

3.1.2.3 Site Access

The proposed site is about 40 km south of Highway 401 and can be accessed via a municipal road (Burr Road) from the south.

3.1.2.4 Construction Equipment

Table 3.2 summarizes the construction equipment that is typically required for this type of site work.

Table 3.2 Construction Equipment

Equipment	Power and Weight	Usage	Quantity
Track-Type Tractor (D8)	179 kW 37.6 T	Land Clearing and Grubbing; Spreading granular material for access road	2
Wheel Tractor-Scraper (615C)	198 kW 25.6 T	Excavating and moving topsoil	1
Hydraulic Excavator (325B)	125 kW 25.9 T	Excavating topsoil and placing backfill	1-2

Equipment	Power and Weight	Usage	Quantity
Backhoe Loader (446B)	82 kW 8.9 T	Excavating topsoil and placing backfill	1
Wheel Loader (966F)	164 kW	Moving soil and granular material	1
Dump Truck (D25D)	194 kW 19.5 T	Transport and placement of granular for access road.	2-4
Motor Grader (14H)	160 kW 18.8 T	Grading of access road during construction (as necessary)	1
Drum Vibratory Compactor (CS-563C)	108 kW 10.9 T	Granular compaction for access road	1-2
Crawler Crane (LS-118)	267 kW 48.9 T	Pile driving	1
Pile Driving Equipment (B-6505 HD)	300 kJ 19.5 T	Mounted on the crawler crane, used for driving piles	4
Rough Terrain Crane (RT500C)	90 kW 23.4 T	Unloading, moving material, equipment, and plant	1
Telescopic Handler (TH83)	81 kW 10.0 T	Unloading, moving material, equipment, and plant	1-2
Concrete Transit Mixers (6 m^3)	12.7 l 450 hp	Transportation and placement of concrete mix for foundations	1-4
Pick-up Trucks (F150 Super Crew)	V8 5.7l	General transportation of small equipment, materials, and personnel	5
Diesel Generators, Air Compressors	175 kW	Power supply for electrical equipment (hand tools, etc)	3
Hand Tools - drills, wrenches, concrete vibrators, welding machines, saws, etc (as necessary)		General construction and assembly activities	15+

3.1.2.5 Security Gate, Fencing and Lighting

The site will be gated and fenced, with additional security measures installed as required by Northland. The fence design includes a chain-link fence, about 2.0 m high, with barbed wire on top of the fence. Inner fencing will be erected around the substation area, and the site will be under continual surveillance by the supervising construction staff. In addition, 24-hr on-site security may be utilized.

For security and maintenance purposes, task-specific lights will be installed on the Project location during construction. A set of lights will be installed near the entrance to the facility. Additional motion sensor security lighting may be installed.

As the Project shares its northern boundary with the airport, the proposed lighting system, fence design and security measures will be reviewed by Northland and the airport authority.

3.1.2.6 *Fire Control Plan*

The Project is very unlikely to be a source of fire, or a contributor to spreading an existing fire. However, there is some rare potential fire hazard due to electrical faults at the PV modules and ancillary equipment. The contractor will prepare a fire control plan for the construction activities. It is anticipated that this will include establishing procedures for specific types of likely fires, training staff accordingly, and keeping fire protection equipment on site.

3.1.2.7 *Drainage*

Based on site visits and preliminary assessments, the existing drainage system appears to be adequate for the Project. The leased land does not have any pre-existing tile drains and most of the area slopes to the southeast end of the property where surface water enters an existing wetland and excavated drainage ditch, which is a Tributary of Melville's Creek. The drainage ditch then proceeds to drain westward off the Project location. A high point within the ditch at the western property boundary causes approximately 1 m depth of water to be retained within the channel, supporting emergent and submergent vegetation. During high precipitation periods and the spring snow melt, surface water would collect at a low wooded area located 150 m from the northern property boundary and running perpendicular to the western property line.

3.1.2.8 *Landscaping and Vegetation*

The Project does not propose any major alteration to the existing landscape for construction purposes. It is not anticipated that any reshaping of the lands will be required for Project construction. After installation of modules, the entire Project area, with the exception of roads and drains, will be covered with a suitable, locally grown, low maintenance vegetation. This will aid in the prevention of soil erosion and the invasion of non-native plant species as well as present a natural appearance. Any temporary access roads built for construction purposes will be cleared, tilled, levelled and covered with vegetation.

3.1.2.9 *Power and Communication*

During construction, electrical power will be provided by portable generators for small equipment and hand tools. For temporary and permanent use, Northland will obtain an electrical power supply feed and communication line from the local utilities.

3.1.2.10 *Water Usage*

In order to meet the water demand during construction, the contractor will be required to provide a temporary water storage facility and to supply water by truck. The water will be used for construction and dust control purposes.

3.1.2.11 *Housekeeping*

It is the contractor's responsibility to maintain proper housekeeping and to keep the Project location orderly in order to prevent unnecessary safety and fire hazards. It is important to Northland to keep a tidy work site and to respect the Project's neighbours in this regard.

Typical construction waste, such as broken PV modules, electrical wires, wood, and miscellaneous packaging materials, will be managed in accordance with local, provincial, and federal regulations

during construction. Recyclable waste will be transported to the closest recycling centre at the expense of the Contractor.

3.1.3 Construction Phases

3.1.3.1 Phase 1 - Site Preparation

Site preparation refers to all necessary activities prior to the construction of foundations, substation, and installation of the PV modules. It includes surveying/staking, site clearing and grubbing, construction of access roads and drainage systems, installation of security gate and fencing, and construction of a staging area.

3.1.3.1.1 Site Survey and Staking

A registered Ontario land surveyor will provide a site survey, and will stake the exact location of the site perimeter for fencing, access road layout, and all foundations and substation.

3.1.3.1.2 Site Clearing and Grading

The proposed leased land has some hedgerows and several scattered trees. Some of the trees will be cleared in order to install PV modules and avoid shadows.

Site grading will occur for the construction of the access road, temporary facilities, staging area, substation and inverter foundations, and trenches for electrical cabling and instrumentation control. Grading involves the excavation and on-site stockpiling of topsoil at designated areas determined in consultation with the landowner and not within 30 m of a water body. Topsoil will remain on site and will be used for site restoration following completion of construction activities. During temporary stockpiling, topsoil will be protected to minimize soil erosion due to wind and rain. Erosion and sedimentation control measures will be installed as necessary to minimize erosion and sedimentation.

3.1.3.1.3 Access Roads

The construction of a new access road, approximately 600 m long, will be necessary to support construction activities and will provide access to the site during the operation phase of the Project. The proposed 5-m wide access road will be constructed with a granular 'B' base and a finished surface of granular 'A' material, sourced from a local aggregate quarry. Geo-grid and geotextile fabric will be used where necessary. The minimum thickness of the access road granular base and top course material will be 300 mm. The road will be constructed with ditches, swales and culverts, where necessary, for proper stormwater run-off, site drainage and to minimize road and soil erosion. The topsoil and subsoil will be removed prior to the placement of the granular base. The use of gravel will maintain permeability to avoid impacts on stormwater flow and will minimize dust generation to reduce water use for dust control during construction. Design of roads, culverts, swales, and ditches will be in accordance with OPSS regulations and local municipal engineering guidelines. Ditches and culverts will be constructed, as necessary, to maintain existing site drainage conditions.

In addition to the main access road, a number of smaller access roads will be constructed. These will be approximately 3 m wide within the leased area in order to minimize any impact to the

environment and to the land. The design of the proposed 3-m wide access roads will be as per the 5-m wide access road.

The Project location is on fairly level ground and has adequate drainage. Based on site visits and preliminary studies, major alteration in the existing drainage pattern for the proposed solar facility is not anticipated. Erosion and sedimentation control measures will be installed as necessary to minimize erosion and sedimentation.

3.1.3.1.4 Temporary Facilities

Part of the work site will be used as a construction staging area, which will require clearing, grading, removal of topsoil, placement of granular material, compaction, and security fencing, prior to use. The staging area will include construction offices, washrooms, first aid station, parking, construction equipment, material and plant storage/laydown area, and an unloading/loading area. Modular trailers will be used for the construction offices, washrooms and first aid station. Washrooms (portable toilets) will be maintained daily during construction. Following Substantial Completion (Project in service), the temporary facilities will be removed from site, followed by removal of granular material, topsoil backfill, and site revegetation.

3.1.3.2 Phase 2 - Construction and Installation of Plant

3.1.3.2.1 Foundations

Foundation construction for electrical equipment, substation, and oil containment basin comprises of excavation and removal of in-situ material, placement of granular material, formwork, reinforcing steel, grounding, and placement of concrete. PV modules will be securely mounted on a lattice type structure supported by either a driven pile foundation, helical pile, ground screw and/or CIDH (Cast-In-Drilled-Hole) pile depending on the soil conditions within the site. These underground support structures will be driven to a design depth below the frost line, capable of supporting the structure.

Ready-mix concrete will be delivered by transit mixer truck from a local supplier. Foundations will require a minimum of 28 days to cure to allow for concrete to reach its specified compressive strength prior to erection of structural support and equipment installation.

Note that there will be no wash station provided on site for pressure washing concrete trucks and/or heavy construction equipment. All equipment will be cleaned off site and is the responsibility of the contractor and/or subcontractor.

3.1.3.2.2 Trenches for Cable and Instrumentation Control

Trenches will be excavated for electrical cabling (including DC cables from the modules to the inverter and AC cables from the inverter to the transformer). Trenches will have a sand base layer below and above the cabling, and will be backfilled with excavated, or suitable imported material in accordance with OPSS guidelines. The layout of the trenches will be such that it will have minimum impact on the existing drainage. Trenches will typically be 1 m deep by 0.5 m wide and will be excavated by using a 'ditch-witch' plough, or similar equipment. Where trenching is not possible due to encountered rock or other reasons, above ground cable-trays will be used. Where necessary, high density polyethylene (HDPE) conduits of suitable diameter will be provided to cross roads.

3.1.3.2.3 Structural Support

The structural support for the system will comprise a steel and/or aluminum lattice structure supported by a pile foundation. This lattice structure will be assembled on site, and mounted on the piles. Modules will then be mounted on the structural support system. Lifting will be done by a small crane.

3.1.3.2.4 Solar Modules

PV modules, weighing approximately 27 kg each, will be mounted on the supporting structure by PV installers.

3.1.3.2.5 Substation

The substation will be located as depicted in Appendix A. Construction will include excavation of topsoil, installation of ground grid, foundation construction, covering of surface area with crushed stone, and installation of electrical equipment. Switchgear and protection and control equipment will be housed in a weatherproof "E-House" building, which is bolted to a concrete foundation. Any outdoor electrical cabinets, such as the transformer control cabinet, will be weatherproof NEMA 4X cabinets. The substation area will be fenced and appropriately signed for safety and security purposes.

3.1.3.2.6 Electrical System

PV modules are proposed to be arranged in eight arrays, with two 625-kW inverters at the center of each array. The nameplate capacity of each module in an array will be approximately 280 W. There will be sufficient modules for each inverter to optimize inverter loading and meet a 1.2 DC-to-AC conversion ratio.

Modules will be strung together in strings of approximately 12 modules. These strings will be brought to combiner boxes. From each combiner box, a single run of DC conductor will be brought to an inverter. The Project will have sixteen 625-kW inverters. These inverters will convert the DC power collected into AC power, and this will be stepped up by transformers adjacent to the inverters to a planned intermediate voltage of 27.6 kV. Conductors at this intermediate voltage will run underground to the Project substation, where one main transformer will step power up to the local distribution voltage of 44 kV. Power will then be run overhead to the nearest Hydro One owned distribution line and switched onto the Hydro One distribution network.

Power collection will be by underground cabling. These cables will be buried at a minimum depth of 915 mm below grade, as is required by the Ontario Electrical Safety Code. The cables will be laid in a trench with a layer of sand above and below, and the trench will then be filled in with the original local material or imported. There will also be a caution tape buried in the trench above the cabling. After filling, the trenches will be graded to bring the land back to its original contours. This will restore the natural drainage prior to the Project development and will have minimum impact to the local flora and fauna. Where trenching is not possible due to encountered rock or other reasons, above ground cable-trays will be used.

There will be a need to construct an overhead distribution line to transmit power from the Project substation to the local distribution network. Northland is working with Hydro One, the operator of the distribution system in the area, to construct a new distribution line between the Project substation

and the "point of interconnection" on the nearest Hydro One owned distribution line. The nearest, appropriately sized distribution line is on Burr Road, approximately 2.5 km to the east of the Project substation. Hydro One is anticipated to complete all the necessary approvals to build, operate and maintain the line for Northland.

3.1.3.3 Phase 3 – Testing and Commissioning

Testing and commissioning will be performed on the installation prior to start up and connection to the power grid. Solar modules, inverters, collection system, and substation will be checked for system continuity, reliability, and performance standards. If problems or issues are identified, modifications will be made prior to start up.

3.1.3.4 Phase 4 – Site Restoration

Site restoration will be applicable for the entire Project location. The main objective will be to re-instate the area to the original pre-construction condition, such as the ecosystem, vegetation, and drainage. All construction material, equipment, temporary facilities, and waste will be removed from the site. Topsoil will be backfilled where required, including landscaping to achieve proper drainage. Revegetation will include planting of native plants and hydro-seeding where required.

3.2 Operation

As the solar power plant is a passive generation facility (i.e., the photovoltaic panels collect sunlight as it is available and are not activated remotely, there is no daily operations regime associated with the Project. The facility will operate 365 d/yr when sufficient solar radiation exists to generate electricity.

Additional information on the Operations and Maintenance of the facility is presented below through a reproduction from Section 4 of the Design and Operations Report (Hatch Ltd., 2010e)

3.2.1 Operations Plan

The Project does not require any permanent on-site operator as it will be operated remotely. For general monitoring and maintenance purposes, two part time or full-time local personnel may be hired and will be dispatched from a central operations office as needed. Any damage or faults with the PV modules and electrical systems will be alerted to staff remotely and repaired (or replaced) by facility staff or qualified professionals. Access to the site will be limited to Project personnel.

Any waste generated during the operations will be removed from the site and managed according to provincial and municipal requirements.

3.2.2 Maintenance Plan

The vegetation coverage, drainage systems and trees will be monitored and maintained regularly. Suitable ground cover will be established under the modules and some form of vegetation abatement may be required several times throughout the summer months. No hazardous chemicals would be used for this vegetation control.

As previously described, the need to clean the solar modules will be determined according to local weather conditions, such as the quantity and frequency of rain and snow at the Project location. At the very most, it is expected that the modules will require cleaning quarterly, but it is possible

cleaning the modules will not be necessary at all. If required, water trucks will bring water to the site to supply the water required. No chemicals would be used for cleaning.

The transformers will be visually inspected on a monthly basis and their status recorded. Any leaks will be repaired immediately. Spill response equipment will be left on site or in the maintenance trucks should leaks be observed. All maintenance materials such as hydraulic fluids, will be brought on site as required and no on-site storage will be made available.

The site will also be visually inspected for any erosion or sedimentation issues and remediation will be implemented as necessary to prevent environmental impacts.

3.3 Decommissioning

Information presented below is a reproduction from Sections 2 and 4 of the Decommissioning Plan Report (Hatch Ltd., 2010f)

It is anticipated that the Project will have a useful lifetime of 30 years which can be extended up to 50 years or more with proper maintenance, component replacement and repowering. For this section of the Report, it is assumed that the Project will be decommissioned in 30 years (or earlier if power purchase agreements are not extended). Northland will make sure that the entire site be restored to its baseline condition, or as desired by the land owners, and meet the requirements of applicable local, provincial and federal legislation.

3.3.1 Equipment Dismantling and Removal

All decommissioning of electrical devices, equipment, and wiring/cabling will be in accordance to local, municipal, provincial and federal agencies standards and guidelines. Any electrical decommissioning will include obtaining the required permits and following lockout/tag out procedures before de-energizing, isolating, and disconnecting electrical devices, equipment and wiring/cabling.

3.3.1.1 PV Modules

There will be approximately 50,000 PV modules, each weighing approximately 27 kg, with dimensions of approximately 2 m long by 1 m wide by 50 mm thick. The modules will be of traditional crystalline (either mono or multi crystalline) technology. All modules will be disconnected, removed from the racks, packaged and transported to a designated location for resale, recycling or disposal. Any disposal or recycling will be done in accordance with local by-laws and requirements.

The steel racks supporting the modules will be unbolted; the vertical steel post supporting the racks will be removed, as well as the foundation. Foundation demolition and removal will be done by mechanical equipment (backhoe-hydraulic hammer/shovel). Demolition debris will be transported by truck to an approved disposal area. The connecting underground cables and the junction boxes will be de-energized, disconnected and removed. Equipment and material may be salvaged for resale, scrap value or disposal depending on market conditions.

3.3.1.2 Electrical Equipment

All decommissioning of electrical devices, equipment, and wiring/cabling will be in accordance to local, municipal, provincial and federal agencies standards and guidelines. Any electrical decommissioning will include obtaining the required permits, and following lockout/tag out procedures before de-energizing, isolating, and disconnection of electrical devices, equipment and wiring/cabling.

Decommissioning will require dismantling and removal of the electrical equipment, including inverters, transformers, underground collection system and overhead lines. The equipment will be de-energized, disconnected and transported off site by truck. Prior to the removal of the main step-up transformer, the oil will be pumped into a separate industry approved disposal container and sealed to prevent any spill during storage and/or transportation. Equipment and material may be salvaged for resale or scrap value depending on the market conditions.

3.3.1.3 Other Components

Removal of all other facility components from the site will be completed, including but not limited to access roads, drains and culverts, concrete foundations, and fences. Upon request from the land owner, access roads, culverts and ditches may remain. Equipment and material may be salvaged for resale, scrap value or disposal, depending on market conditions. For safety and security, the security fence will be the final component dismantled and removed from the site.

3.3.2 Site Restoration

Following decommissioning of the Project, if any lands or water features are negatively affected by the Project, Northland is committed to restoring the site as close to its pre-construction state as feasible. This would be subject to environmental requirements and wishes of the landowner. Note that as per environmental studies completed for the Renewable Energy Approval, negative impacts to water features are not expected.

The following actions are anticipated to be completed:

- All equipment, foundations and imported material (including roads) will be removed from site in accordance to applicable to local, municipal, provincial and federal guidelines and regulations.
- Any damage to existing tile drainage system caused by the Project will be repaired/restored.
- Any excavation and/or trench, not related to the pre-construction drainage, will be backfilled with the appropriate material and graded to original contours, including natural drainage.
- Should the subsoil be negatively affected and compromise the future productive use of the land, the following will be implemented: First the topsoil will be removed and stockpiled. Then the subsoil may be ripped and tilled prior to grading it. Topsoil will then be replaced to its original condition, and subject to landowner consent, revegetated.
- Should the soil be negatively affected and compromise the future productive use of the land, nutrients may be added or fertilizers deployed.
- Topsoil and compost will be blended where required, spread and replaced to original depth.

- Hydroseeding with approved seed mixture and mulching during the appropriate seasonal conditions, as subject to the environmental requirements and to landowner consent.

4. Potential Negative Environmental Effects and Proposed Mitigation Measures

This section describes the anticipated negative environmental effects on the identified significant natural features that could occur as a result of construction, operation and decommissioning phases of the Project (as described in Section 3).

Mitigation measures are proposed to minimize, eliminate or alleviate any negative effects. Potential negative effects are discussed by environmental component, where affects on the land could negatively affect the significant natural features.

These effects are discussed below by significant natural feature.

4.1 Milksnake Habitat

The agricultural lands on and within 120 m of the Project location were identified as significant foraging habitat for Milksnake, while the hedgerow on the Project location was identified as a significant movement corridor for Milksnake within the foraging habitat. Potential impacts to Milksnake habitat as a result of construction, operations, and decommissioning are addressed below by project phase.

4.1.1 Construction

Construction of the Project will result in direct encroachment onto the significant wildlife habitat for Milksnake that is present on the Project location. This will result in a temporary loss during construction of foraging and movement corridor habitat for Milksnake.

The foraging habitat lost represents a fraction of the available habitat for Milksnake within the region, and no hibernacula features are known from the Project location. It is not possible to mitigate this effect, however, this effect is not expected to impact the form or function of Milksnake foraging habitat present within the regional area beyond the lands on the Project location. Further, in order to minimize the scale of impact, work areas will be well marked and workers will be advised to remain within the bounds of the demarcated work areas.

The hedgerow that provides the movement corridor habitat on the Project location will be permanently removed. In order to ensure no loss of function, a line of shrubs will be planted on the outside of the fence along the western boundary of the Project location. As the feature will be continuous, and connect the wetland and woodland, it will provide improved function as a movement corridor for Milksnake over the existing hedgerow.

Beyond direct impacts to their habitat, Milksnake are habitat generalists and may be at risk of incidental take as a result of construction activities. In order to minimize the potential for incidental take of wildlife, speeds on access roads of the Project location will be restricted. Further, daily visual monitoring of the project location and construction machinery will be completed to search for wildlife to ensure that potential impacts to these species are minimized. In addition, the construction

workforce will be made aware of the potential for wildlife occurring on the Project location and that measures should be taken to avoid wildlife wherever possible. Prior to construction, protocols for wildlife encounters on the Project location will be established with the MNR in order to ensure there is no impact on the species. It is expected that such protocols will consist of

- allowing wildlife to move freely through the Project location (the preferred option)
- directing wildlife off the Project location where possible (i.e., in case of deer or turkeys), or
- removal of the wildlife from the Project location by an individual trained in the safe handling and transport of wildlife.

The use of the mitigation measures identified above is expected to result in a negligible risk to Milksnake of incidental take. However, if incidental take of Milksnake are noted, work within the area will be ceased immediately, and the Ministry of Natural Resources (MNR) will be contacted to make them aware of the occurrence. Work in the area will remain ceased until a survey is conducted by a trained biologist to ensure that there are no Milksnake present in the area.

The presence of the construction workforce and construction activities associated with the Project will also result in auditory and visual disturbance of local wildlife populations. Milksnake may temporarily retreat from these areas during construction as a result of the disturbance; however, as there is abundant habitat within the area, this is not expected to impact the local population.

Therefore, as a result of the mitigation measures identified above, the sole impact expected on Milksnake habitat during construction is the temporary loss of foraging and movement corridor habitat within the Project location.

4.1.2 Operation

Operation of the Project is not expected to impact form or function of Milksnake habitat on the Project location as all activities will be restricted to the previously disturbed Project location.

Similar to construction, beyond any direct impacts to their habitat, Milksnake may be at risk of incidental take during maintenance activities. Similar to construction, speeds on access roads of the Project location will be restricted. Further, daily visual monitoring of work areas and maintenance machinery will be completed to search for wildlife to ensure that potential impacts to these species are minimized. In addition, the maintenance workforce will be made aware of the potential for wildlife occurring on the Project location and that measures should be taken to avoid wildlife wherever possible. As previously described in Section 4.1.1.1 with respect to construction, prior to operations, protocols for wildlife encounters on the Project location will be established with the MNR in order to ensure there is no impact on the species.

The use of the mitigation measures identified above is expected to result in a negligible risk to Milksnake of incidental take. However, if incidental take of Milksnake are noted, work within the area will be ceased immediately, and the MNR will be contacted to make them aware of the occurrence. Work in the area will remain ceased until a survey is conducted by a trained biologist to ensure that there are no Milksnake present in the area.

Given that maintenance activities are expected to be short term, and since Milksnake are commonly observed around manmade structures, operations activities are not expected to impact Milksnake foraging on agricultural fields within 120 m of the Project location.

As a result, operations are not expected to result in impacts to Milksnake or Milksnake habitat.

4.1.3 Decommissioning

During the decommissioning phase, all disturbed areas of the Project location will be restored such that there will be a restoration of all previously lost general use Milksnake habitat.

Disturbances present in the area will be similar to those that may occur during the construction phase as described in Section 4.1, and mitigation measures employed during construction will be used during decommissioning.

Overall, there will be a net benefit for Milksnake during decommissioning as a result of habitat restoration previously lost as a result of Project construction.

4.2 Raptor Nesting Location

A stick nest was identified along the edge of Woodland 4 within 120 m east of the Project location. The area within 200 m of the nest has been identified as significant wildlife habitat for support functions to the raptor nest.

Potential impacts to the raptor nest site as a result of construction, operations, and decommissioning are addressed below by project phase.

4.2.1 Construction

As construction is scheduled to occur during the raptor nesting period, the nesting location will be visited prior to construction to determine whether the nest is active. This will entail an individual trained in the identification of raptors either (i) observing whether there is any activity at the nest, (ii) performing a call playback at the nest to determine if any raptors are nearby, and (iii) if possible, using a telescopic pole with a mirror attached to view into the nest in order to determine if there are any eggs/nestlings present.

If the nest is active, a 200 m buffer around the nest will be demarcated on the Project location using stakes placed at 20 m intervals. No construction activity will be permitted within 200 m of the raptor nest until August 1, or it is the determination of an individual with familiarity of raptor biology that the nest is no longer active and concurrence is obtained from the Ministry of Natural Resources.

If the nest is determined to be not active, construction can proceed as required.

The use of these mitigation measures will ensure that there is no impact on the form or function of the raptor nesting habitat.

4.2.2 Operations

As there are no moving parts and very little noise associated with an operating solar Project, and since there is limited requirement for on-site maintenance, it is not expected that the present of the Project would prevent raptor nesting in the current location. Red-tailed hawks, the species presumed to be using the nest, commonly nest near manmade structures, often including those with high levels

of disturbance (such as quarries, highways, etc.), and therefore the low levels of disturbance associated with the solar project would not be expected to impact red-tailed hawk nesting.

Similarly, the presence of the solar panels within the agricultural fields should not significantly impact the support function of the nest. It is expected that small mammal (mice, voles) populations will remain present within the Project location such that the provision of prey will remain unaltered. Red-tailed hawks commonly forage around manmade structures, and are often observed foraging in the narrow right-of-ways associated with highway corridors. Therefore, it is expected that red-tailed hawks will forage within the boundaries of the Project location between the solar panels.

As a result, no significant impacts to the form or function of the raptor nesting habitat is anticipated during operations

4.2.3 Decommissioning

During the decommissioning phase, all disturbed areas of the Project location will be restored such that there will be a restoration of all habitat to pre-existing conditions.

Disturbances present in the area will be similar to those that may occur during the construction phase as described in Section 4.31, and mitigation measures employed during construction will be used during decommissioning.

Overall, there will be a net benefit during decommissioning as a result of habitat restoration previously disturbed as a result of Project construction.

4.3 Woodland 4

Woodland 4, within 120 m east of the Project location, was identified as a significant woodland for availability of interior forest and proximity to a locally significant wetland east of the woodland (i.e., on the opposite side of the Project location).

Potential impacts to the woodland as a result of construction, operations, and decommissioning are addressed below by project phase.

4.3.1 Construction

As the woodland is not located on the Project location, there will be no direct encroachment into the woodland, and therefore no impact on either the amount of interior forest available (and therefore the function of provision of forest interior habitat), or the woodlands proximity to the locally significant wetland.

In order to ensure that there is no accidental impact to the woodland, work areas will be well marked and workers will be advised to remain within the bounds of the demarcated work areas. Further, workers will be advised not to enter natural areas beyond the boundaries of the work area. This will ensure that disturbance within the woodland is minimized.

Further to the direct impacts of encroachment, indirect impacts may occur on the woodland.

Dust may be mobilized due to vehicular traffic and heavy machinery use, drilling (if necessary for solar panel installation) and soil moving activities (e.g., excavation, trenching).

However, it is not anticipated that the potential impacts can be substantially mitigated through the use of standard construction site best management practices and mitigation measures. In this regard, the document entitled "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities" (Cheminfo Services Inc., 2005) will be used as a guideline for contractors. Mitigation measures to be used, as required, to control dust include

- use of approved dust suppression (i.e., water or non-chloride based materials) on exposed areas including access roads, stockpiles and works/laydown areas as necessary
- hard surfacing (addition of coarse granular A material, free of fine soil particles) of access roads or other high-traffic working areas
- phased construction, where possible, to limit the amount of time soils are exposed
- avoid earth moving works during excessively windy weather. Stockpiles to be worked (e.g., loaded/unloaded) from the downwind side to minimize wind erosion
- stockpiles and other disturbed areas to be stabilized as necessary (e.g., tarped, mulched, graded, revegetated or watered to create a hard surface crust) to reduce/prevent erosion and escape of fugitive dust.

Visual monitoring of dust generation will occur during the construction period and if dust is observed to be of concern, additional mitigation will be implemented. Given the mitigation and monitoring proposed, it is anticipated that dust generation will be relatively low in magnitude and limited in duration and geographical area, such that no negative effects on vegetation communities will occur as a result of dust.

In addition to dust generation, woodland habitat may also be impacted by alterations to surface water runoff. Activities that could occur during the construction phase that would have the potential to affect surface water runoff patterns and rates include

- land grading and ditching associated with access roads
- soil compaction due to heavy equipment or stockpiling
- vegetation removal.

The potential negative effects and proposed mitigation measures associated with these activities are discussed in the Waterbodies Environmental Impact Study (Hatch Ltd., 2010g). In general, it was concluded that through the use of effective mitigation measures, there will be no measurable change in surface water runoff as a result of soil compaction and vegetation removal. Further, land will be graded such that surface water runoff flows in the same general direction as present, therefore no alterations in moisture regime are anticipated. This will ensure that there is no impact on the woodlands function of contribution to local and regional water quality.

Therefore, there will be no impact on the form or function of the woodland as a result of construction activities.

4.3.2 Operations

As the woodland will be located off the Project location, and outside of the fence, there is no potential for direct encroachment onto this feature during operations. Therefore, there is no potential for impact to the form of the woodland during operations.

In respect of function, as the woodland is not on the Project location, the potential for impact to function is low. Further, as regular maintenance is anticipated to occur infrequently during the year, this would be consistent with existing disturbances on the Project location from agricultural operations.

As a result, there will be no impact to form or function of the woodland during operations.

4.3.3 Decommissioning

Disturbances present in the area will be similar to those that may occur during the construction phase as described in Section 4.2.1, and mitigation measures employed during construction will be used during decommissioning.

As a result, there will be no impact on the form or function of the woodland during decommissioning.

4.4 Western Chorus Frog Habitat

The wetland within 120 m south of the Project location was identified as significant wildlife habitat for Western Chorus Frog. Potential impacts to Western Chorus Frog habitat as a result of construction, operations, and decommissioning are addressed below by project phase.

4.4.1 Construction

Habitat for Western Chorus Frog is located entirely off of the Project location within the wetland habitat south of the Project location. The minimum distance between the Project location and this habitat is 30 m.

Mitigation measures previously identified in respect of the woodland (see Section 4.2.1) will also be effective at mitigation potential impacts to the form or the function of the Western Chorus Frog habitat.

Western Chorus Frogs are expected to be less sensitive to disturbance effects than other wildlife species (such as birds), however there may still be a retreat from the immediate vicinity of work areas near the Western Chorus Frog habitat. However, given the size of the wetland, this is not expected to impact the overall availability of Western Chorus Frog habitat or the function of the wetland as Western Chorus Frog habitat.

Therefore, construction will not have an impact on the form or function of Western Chorus Frog habitat.

4.4.2 Operation

Mitigation measures previously identified in respect of the woodland (see Section 4.2.2) will also be effective at mitigation potential impacts to the form or the function of the Western Chorus Frog habitat.

No impact to form or function of Western Chorus Frog habitat is anticipated as a result of operations activities.

4.4.3 Decommissioning

Disturbances present in the area will be similar to those that may occur during the construction phase as described in Section 4.3.1, and mitigation measures employed during construction will be used during decommissioning.

As a result, there will be no impact on the form or function of the Western Chorus Frog habitat during decommissioning.

4.5 Watercourse and Associated Marshland Habitats within 120 m South of the Project Location

The watercourse and associated marshland habitats within 120 m south of the Project location were identified as significant amphibian breeding habitat (wetland), amphibian movement corridor, and Northern Ribbonsnake habitat). Potential impacts to these significant wildlife habitats as a result of construction, operations, and decommissioning are addressed below by project phase.

4.5.1 Construction

These habitats are located entirely off of the Project location associated within the watercourse south of the Project location. The minimum distance between the Project location and these habitats is 30 m, with most of the identified habitat located more than 100 m from the Project location.

Mitigation measures previously identified in respect of the woodland (see Section 4.2.1) will also be effective at mitigation potential impacts to the form or the function of these habitats.

Given the separation between the Project location and the identified habitats, construction activities are not expected to result in disturbance of wildlife within the habitats.

Therefore, construction will not have an impact on the form or function of Northern Ribbonsnake habitat, amphibian breeding habitat (wetland) or the amphibian movement corridor.

4.5.2 Operation

Mitigation measures previously identified in respect of the woodland (see Section 4.2.2) will also be effective at mitigation potential impacts to the form or the function of these habitats.

No impact to form or function of the Northern Ribbonsnake habitat, amphibian breeding habitat (wetland) or the amphibian movement corridor is anticipated as a result of operation activities.

4.5.3 Decommissioning

Disturbances present in the area will be similar to those that may occur during the construction phase as described in Section 4.3.1, and mitigation measures employed during construction will be used during decommissioning.

As a result, there will be no impact on the form or function of the Northern Ribbonsnake habitat, amphibian breeding habitat (wetland) or the amphibian movement corridor during decommissioning.

5. Environmental Effects Monitoring Plan – Design and Operations Report

As discussed in the Design and Operations Report (Hatch Ltd., 2010e) environmental effects monitoring is proposed in respect of any negative environmental effects that may result from engaging in the Project. As per the REA Regulation, the monitoring plan identifies

- performance objectives in respect of the negative environmental effects
- mitigation measures to assist in achieving the performance objectives
- a program for monitoring negative environmental effects for the duration of the time the Project is engaged in, including a contingency plan to be implemented if any mitigation measures fail.

For the purposes of this EIS report, the effects monitoring measures with respect to negative effects on the significant natural features have been reproduced here, in Table 5.1.

The monitoring proposed in Table 5.1 will serve to verify that mitigation measures are functioning as designed to meet performance objectives. If monitoring shows that performance objectives are not being met, the contingency measures documented in Table 5.1 will be used to ensure that remedial action is undertaken as necessary to meet the performance objectives.

6. Construction Plan Report

The REA Regulation requires proponents of Class 3 solar projects to prepare a Construction Plan Report (CPR) (Hatch Ltd., 2010d). The CPR details the construction and installation activities, location and timing of construction and installation activities, any negative environmental effects that result from construction activities within 300 m of the Project and proposed mitigation measures for the identified negative environmental effects. The CPR addresses all potential effects of construction on natural features within 300 m of the Project location in a general manner. The mitigation proposed in the CPR with respect to preventing/minimizing negative effects on significant natural features is the same as that discussed in this EIS. Additional mitigation is proposed to address negative effects during construction not related to significant natural features. Therefore, the CPR and this EIS should be read in conjunction with each other, although all negative effects and mitigation requirements with respect to significant natural features are contained within this EIS and duplicated in the CPR.

Table 5.1 Summary of Environmental Effects Monitoring Requirements with Respect to Significant Natural Feature

Negative Effect	Mitigation Strategy	Performance Objective	Monitoring Plan					Contingency Measures
			Methodology	Monitoring Locations	Frequency	Rationale	Reporting Requirements	
Construction Phase								
Disturbance of nesting raptors	Confirmation of activity at raptor nest prior to construction. If nest is active, a 200 m buffer will be marked with no work permitted within the buffer.	Minimize disturbance to nesting raptors.	Confirmation of activity will be completed by (i) observing nest activity, (ii) performing a call playback, and (iii) observation in the nest of eggs/nestling	At nest site.	Once a week for 3 weeks prior to start of construction.	Repeated monitoring will enable an accurate determination of whether the nest is accurate.	Reported following final monitoring session in memorandum to MNR Peterborough.	If nest is determined to be not active, construction may proceed as usual.
			If nest is active, visual monitoring of the area within 200 m of the nest will be conducted.	Within 200 m of the nest.	Ongoing during construction.	Visual monitoring would ensure boundaries of work areas are respected.	Reported in monthly environmental monitoring report during construction.	If work beyond the boundaries is noted, MNR Peterborough to be notified, remediation actions to be undertaken to restore impacted area. If repeated encroachments are observed, a fence is to be installed along the 200 m buffer.
Potential disturbance of previously unknown snake hibernaculum	Project location to be searched following completion of grading activities, if required, to identify any potentially exposed snake hibernaculum. Construction workforce to be made aware of both (i) the possibility of large numbers of snakes being present on the Project location during construction in the spring or fall, and (ii) to be aware of features that may provide snake hibernaculum.	Prevent impact to snake hibernacula.	Project location to be crossed in transects spaced 20 m apart following grading to look for any recently exposed features that may provide snake hibernacula.	Throughout construction site.	Following any grading activities, if required.	This will ensure any new features that may provide snake hibernaculum are identified.	Reported in monthly environmental monitoring report during construction.	If potential snake hibernaculum are identified; MNR Peterborough to be contacted and further discussions will be held to identify appropriate contingency measures.
Encroachment onto Milksnake habitat Accidental encroachment into significant wildlife habitats within 120 m of the Project location	Work areas to be well marked. Construction workforce to be advised to stay within the boundaries of the work areas and not to enter natural vegetation communities off of the Project location.	Minimized size of disturbed area.	Visual monitoring of work area.	Throughout construction site.	Ongoing during construction.	Visual monitoring would ensure boundaries of work areas are respected.	Reported in monthly environmental monitoring report during construction.	If work beyond the boundaries is noted, remediation actions to be undertaken to restore impacted area.

Negative Effect	Mitigation Strategy	Performance Objective	Monitoring Plan					Contingency Measures
			Methodology	Monitoring Locations	Frequency	Rationale	Reporting Requirements	
Incidental take of wildlife	Daily visual monitoring of work areas and construction equipment prior to start of work. Wildlife observed will be removed from areas of impact through established protocols. Speeds to be limited on Project location and construction workforce to be made aware of potential for wildlife on the Project location.	Avoid occurrences of incidental take.	Daily visual monitoring will be conducted by workers on foot of the areas to be worked on the given day. Any wildlife observed will be managed in accordance with protocols for wildlife encounters to be developed with MNR.	Throughout construction site.	Ongoing during construction on a continued basis.	Incidental take will be reported by construction workforce to the on-site personnel responsible for environmental protection if incidents occur.	Reported in monthly environmental monitoring report during construction, unless the species is a species of conservation concern in which case reporting will be immediate to the MNR.	If incidental take of species of conservation concern are recorded, work will be ceased until such time as a trained biologist can state that the species is no longer present in the area.
Dust generation and off-site transport	Standard construction site best management practices to prevent fugitive dust.	Minimize fugitive dust from the construction site.	Visual monitoring of visible dust plumes during construction.	Throughout construction site.	Periodically during all construction activities.	Visual dust monitoring would identify if dust plumes are an issue and where their source may be.	Reported in monthly environmental monitoring report during construction.	Dust control measures implemented as necessary to prevent/minimize dust generation.
Operations Phase								
Disturbance of amphibian/Western Chorus Frog breeding within identified wildlife habitats	None required as no negative effect anticipated.	Ensure no negative effect on breeding amphibian populations.	Prior to construction a baseline monitoring program following the protocols of the Marsh Monitoring Program (i.e., 3 visits during the breeding season) will be completed to identify breeding populations. This will be repeated for the first 3 years following construction to verify the effect.	Within the wetland habitats; exact locations to be determined prior to commencement of study.	Three visits per breeding season.	Following the protocols of the Marsh Monitoring Program will enable a determination of the general health of the breeding population.	Reported annually following final monitoring session in memorandum to MNR Peterborough District.	If negative effects on the amphibian population are noted; additional discussions will be held with MNR Peterborough District to determine appropriate contingency measures.
Disturbance of raptor nesting	None required as no negative effect anticipated.	Ensure no negative effect on identified raptor nesting location.	The nest location will be visited bi-weekly during the breeding period (April through July) to confirm activity (see methods in construction) and verify that there is no effect on the raptor nest.	At the identified nest location.	Bi-weekly during raptor breeding season.	Following this monitoring program will enable a determination of whether the Project is having an impact on raptor nesting at the identified nest location.	Reported annually following final monitoring session in memorandum to MNR Peterborough District.	If negative effects on raptor nesting at the identified nest location are noted; additional discussions will be held with MNR Peterborough District to determine appropriate contingency measures.
Loss of breeding bird habitats on the Project location	Not possible to mitigate this effect.	Determine which bird species are breeding on the Project location.	Breeding Bird Survey consisting of point counts and area searches complete in accordance with standard protocols.	Throughout Project location.	Twice during breeding season.	Following the requirements of a typical breeding bird survey program will enable a determination of which species are breeding within the Project location.	Reported annually following final monitoring session in memorandum to MNR Peterborough District.	None required.

Negative Effect	Mitigation Strategy	Performance Objective	Monitoring Plan					Contingency Measures
			Methodology	Monitoring Locations	Frequency	Rationale	Reporting Requirements	
Incidental take of wildlife	Speeds to be limited on Project location and maintenance workforce to be made aware of potential for wildlife on the Project location. Visual monitoring of access roads for wildlife species.	Avoid occurrences of incidental take.	Occasions of incidental take to be reported as they are identified.	Throughout Project location.	Ongoing during maintenance activities.	Incidental take will be reported by maintenance staff to the on-site personnel responsible for environmental protection if incidents occur.	No requirement; unless the incident involves a species of conservation concern in which case reporting will be immediate to the MNR.	If incidental take of species of conservation concern are recorded, work will be ceased until such time as a trained biologist can state that the species is no longer present in the area.
Decommissioning Phase								
Encroachment onto Milksnake habitat Accidental encroachment into significant wildlife habitats within 120 m of the Project location	Work areas to be well marked. Decommissioning workforce to be advised to stay within the boundaries of the work areas and not to enter natural vegetation communities off of the Project location.	Minimized size of disturbed area.	Visual monitoring of work area.	Throughout decommissioning site.	Ongoing during decommissioning.	Visual monitoring would ensure boundaries of work areas are respected.	Reported in monthly environmental monitoring report during decommissioning.	If work beyond the boundaries is noted, remediation actions to be undertaken to restore impacted area.
Incidental take of wildlife	Daily visual monitoring of work areas and decommissioning equipment prior to start of work. Wildlife observed will be removed from areas of impact through established protocols. Speeds to be limited on Project location and decommissioning workforce to be made aware of potential for wildlife on the Project location.	Avoid occurrences of incidental take.	Daily visual monitoring will be conducted by workers on foot of the areas to be worked on the given day. Any wildlife observed will be managed in accordance with protocols for wildlife encounters to be developed with MNR.	Throughout decommissioning site.	Ongoing during decommissioning on a continued basis.	Incidental take will be reported by decommissioning workforce to the on-site personnel responsible for environmental protection if incidents occur.	Reported in monthly environmental monitoring report during decommissioning, unless the species is a species of conservation concern in which case reporting will be immediate to the MNR.	If incidental take of species of conservation concern are recorded, work will be ceased until such time as a trained biologist can state that the species is no longer present in the area.
Dust generation and off-site transport	Standard site best management practices to prevent fugitive dust.	Minimize fugitive dust from the Project location.	Visual monitoring of visible dust plumes during decommissioning.	Throughout Project location.	Periodically during all decommissioning activities.	Visual dust monitoring would identify if dust plumes are an issue and where their source may be.	Reported in monthly environmental monitoring report during decommissioning.	Dust control measures implemented as necessary to prevent/minimize dust generation.

7. Summary and Conclusions

As discussed in the Natural Heritage Records Review (Hatch Ltd. 2010a), the Natural Heritage Site Investigation (Hatch Ltd. 2010b) and the Evaluation of Significance (Hatch Ltd., 2010c) there is significant wildlife habitat present on and within 120 m of the Project location, as well as a significant woodland community within 120 m of the Project location.

The EIS has been prepared to identify potential negative environmental effects that all phases of the Project may have on these significant natural features. Mitigation measures have been proposed to prevent these effects from occurring or minimize the magnitude, extent, duration and frequency in the event that they do occur to an acceptable level. Monitoring measures have been proposed to confirm that mitigation measures are having the intended effect and that performance objectives are being met.

Table 7.1 documents the significant natural features and associated mitigation measures and monitoring requirements.

8. References

Cheminfo Services Inc. 2005. Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities. Prepared for Environment Canada. March 2005. 49 pp.

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Table 7.1 Natural Features on and within 120 m of the Project Location

Feature	Attributes/Composition	Function	Significant?	Mitigation Strategy (C = Construction, O = Operation, D = Decommissioning)	Monitoring Requirements
Wetland	hS_1 [ELC: Green Ash Mineral Deciduous Swamp Type (SWDM2-2)] tsS_4 [ELC: Willow Mineral Deciduous Thicket Swamp Ecosite (SWTM3)] hS_2 [ELC: Green Ash Mineral Deciduous Swamp Type (SWDM2-2)] neM_1 [ELC: Mixed Graminoid Mineral Meadow Marsh Type (MAMM1-16)] reM_2 [ELC: Cattail Mineral Shallow Marsh Type (MASM1-1)] hS_3 [ELC: Silver Maple Mineral Deciduous Swamp Type (SWDM3-2)]	- Wildlife habitat - Primary production - Watershed protection - Preservation of biodiversity - Fish habitat - Support of natural cycles	Non-Provincially Significant.	To be addressed in the Construction Plan Report (Hatch, 2010d)	To be addressed in the Construction Plan Report (Hatch, 2010d)
Wildlife Habitat					
Raptor nesting habitat	- Stick nest located along the edge of Woodland 4. - Grassland and woodland communities within 200 m of the nest provide foraging habitat.	Provision of nesting and foraging habitat for raptor species.	Significant.	C –Determination of activity prior to construction; if nest is active, no construction within 200 m O –None required D –Determination of activity prior to decommissioning; if nest is active, no construction within 200 m	Monitoring of compliance with 200 m setback, if required. Monitoring of nest activity during breeding season for 3 years following completion of construction to verify effect.
Amphibian breeding habitat and amphibian movement corridor	Located within the wetland community within 120 m of the Project location.	Provision of breeding habitat for amphibian communities, as well as a movement corridor for amphibian from breeding areas to over-wintering sites.	Significant.	C –30 m setback from boundary of feature; Demarcation of work areas; Dust control measures; Surface water runoff protection O –None required D –Same as construction	Monitoring of compliance with work area boundaries and use of dust control measures during construction and decommissioning Monitoring of amphibian breeding activity within identified habitats for 3 years following completion of construction to verify effect.
Open country bird breeding habitat	Located within the agricultural fields on and within 120 m of the Project location. Agricultural fields consisted of old hay fields.	Open country bird breeding habitat provides breeding areas for grassland bird species; species which once relied on tall grass prairie habitats, a habitat type which is no longer common within the province.	Non-significant.	To be addressed in the Construction Plan Report (Hatch, 2010d)	To be addressed in the Construction Plan Report (Hatch, 2010d)
Northern Ribbonsnake Habitat	Located within the wetland community within 120 m south of the Project location.	Provision of Northern Ribbonsnake breeding habitat.	Significant.	C –30 m setback from boundary of feature; Demarcation of work areas; Dust control measures; Surface water runoff protection O – None required D – Same as construction	Monitoring of compliance with work area boundaries and use of dust control measures during construction and decommissioning
Western Chorus Frog Habitat	Located within the wetland community within 120 m south of the Project location.	Provision of Western Chorus Frog breeding habitat.	Significant.	C –30 m setback from boundary of feature; Demarcation of work areas; Dust control measures; Surface water runoff protection O – None required D – Same as construction.	Monitoring of compliance with work area boundaries and use of dust control measures during construction and decommissioning Monitoring of Western Chorus Frog breeding activity within identified habitats for 3 years following completion of construction to verify effect.

Feature	Attributes/Composition	Function	Significant?	Mitigation Strategy (C = Construction, O = Operation, D = Decommissioning)	Monitoring Requirements
Milksnake Habitat	Agricultural fields within 120 m of the Project location.	Provision of movement corridor (hedgerow) and foraging habitat (agricultural fields) for Milksnake.	Significant.	C –Demarcation of work areas; Relocation of hedgerow to western edge of Project location; Measures to avoid incidental take. O –Measures to avoid incidental take. D –Demarcation of work areas; Measures to avoid incidental take.	Monitoring of incidental take and compliance with work area boundaries.
Woodlands					
Woodland 1	Green Ash Mineral Deciduous Swamp Type (SWDM2-2).	Contribution to local and regional water quantity and quality.	Non-significant.	To be addressed in the Construction Plan Report (Hatch, 2010d).	To be addressed in the Construction Plan Report (Hatch, 2010d).
Woodland 2	Dry-Fresh Red Cedar Coniferous Forest Type FOC2-1).	Contribution to local and regional water quantity and quality.	Non-significant.	To be addressed in the Construction Plan Report (Hatch, 2010d).	To be addressed in the Construction Plan Report (Hatch, 2010d).
Woodland 3	Green Ash Mineral Deciduous Swamp Type (SWDM2-2).	Contribution to local and regional water quantity and quality.	Non-significant.	To be addressed in the Construction Plan Report (Hatch, 2010d).	To be addressed in the Construction Plan Report (Hatch, 2010d).
Woodland 4	Dry-Fresh Red Cedar Coniferous Forest Type FOC2-1).	- Contribution to local and regional water quantity and quality. - Interior forest habitat.	Significant.	C –Demarcation of work areas; Dust control measures; Surface water runoff protection. O – None required. D – Same as construction.	Monitoring of compliance with work area boundaries and use of dust control measures during construction and decommissioning.

Appendix A

Site Layout

LEGEND:

- GRAVEL ACCESS ROAD
- GATE
- OVERHEAD 44 kV LINE
- OVERHEAD 44 kV LINE BY HYDRO ONE
- PROPERTY BOUNDARY
- CULVERT
- AVAILABLE AREA BOUNDARY / FENCE LINE & PROPERTY SETBACK @ 10 m (CONSTRUCTION SILT FENCE)
- CONSTRUCTION LAYDOWN AND POTENTIAL SOLAR MODULE AREA
- PCC (POINT OF COMMON COUPLING)
- 163 RACKS IN ONE GROUP, 3 STRINGS OF 11 PANELS PER RACK (SET @ 30° TILT WITH 7.6 METERS SPACING)
  42,900 PANELS REQUIRED, AND 43,032 PANELS USED FOR LAYOUT.
  NOMINAL CAPACITY: 12 MW_{DC} OR 10 MW_{AC}

7 — 2 x 625 kVA INVERTER
1 x 1250 kVA TRANSFORMER

0m 50m 100m 150m 200m
1:2000 SCALE

PRELIMINARY LAYOUT
NOT FOR CONSTRUCTION

REVISIONS

NO	DATE	SYMBOL	REMARKS
P0	NOV 2010		ISSUED FOR CONSTRUCTION PLAN REPORT

STAMP

COGENERATION Associates Limited

PREPARED FOR
NORTHLAND POWER

PROJECT
NORTHLAND POWER SOLAR BELLEVILLE NORTH

DRAWN BY	TIEN PHAM	VERIFIED BY	
SCALE	N.T.S.	VERIFIED BY	
DATE	NOV 2010	APPROVED BY	
ISSUED FOR TENDER			
PROJECT No.			

TITLE: SOLAR FARM PROJECT SITE PLAN

DRAWING No. **SP-02 (BELLEVILLE N.)** Rev.P0