



**NORTHLAND  
POWER**

# North Burgess Solar Project Natural Heritage Environmental Impact Study

November 11, 2011

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

Natural Heritage  
Environmental Impact Study

North Burgess Solar Project

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Project Report

November 11, 2011

**Northland Power Inc.**  
**North Burgess Solar Project**

**Natural Heritage Environmental Impact Study**

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## 1. Introduction

Northland Power Solar North Burgess LP (hereinafter referred to as “Northland”) is proposing to develop a 10-megawatt (MW) solar photovoltaic project titled North Burgess Solar Project (hereinafter referred to as the “Project”). The Project location is approximately 78 hectares (ha) in size and is located on Narrows Lock Road near the intersection with Scotch Line, within the Township of Tay Valley, within Lanark County (Figure 1.1).

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 significant 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 adjacent to the Project location, including the Records Review Report, Site Investigation Report, Evaluation of Significance, and if necessary, the EIS. The legislative requirements for these reports are summarized in the following sections.

#### 1.1.1 Records Review Report

Section 25 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 3 of Section 25 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 25 (3)
- 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.

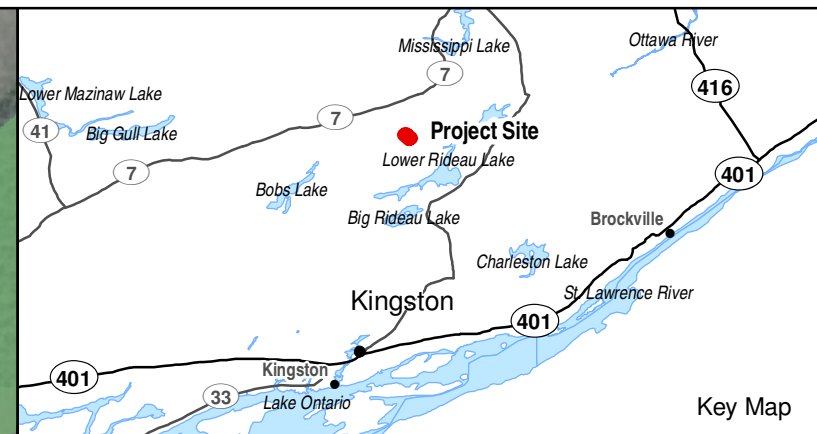
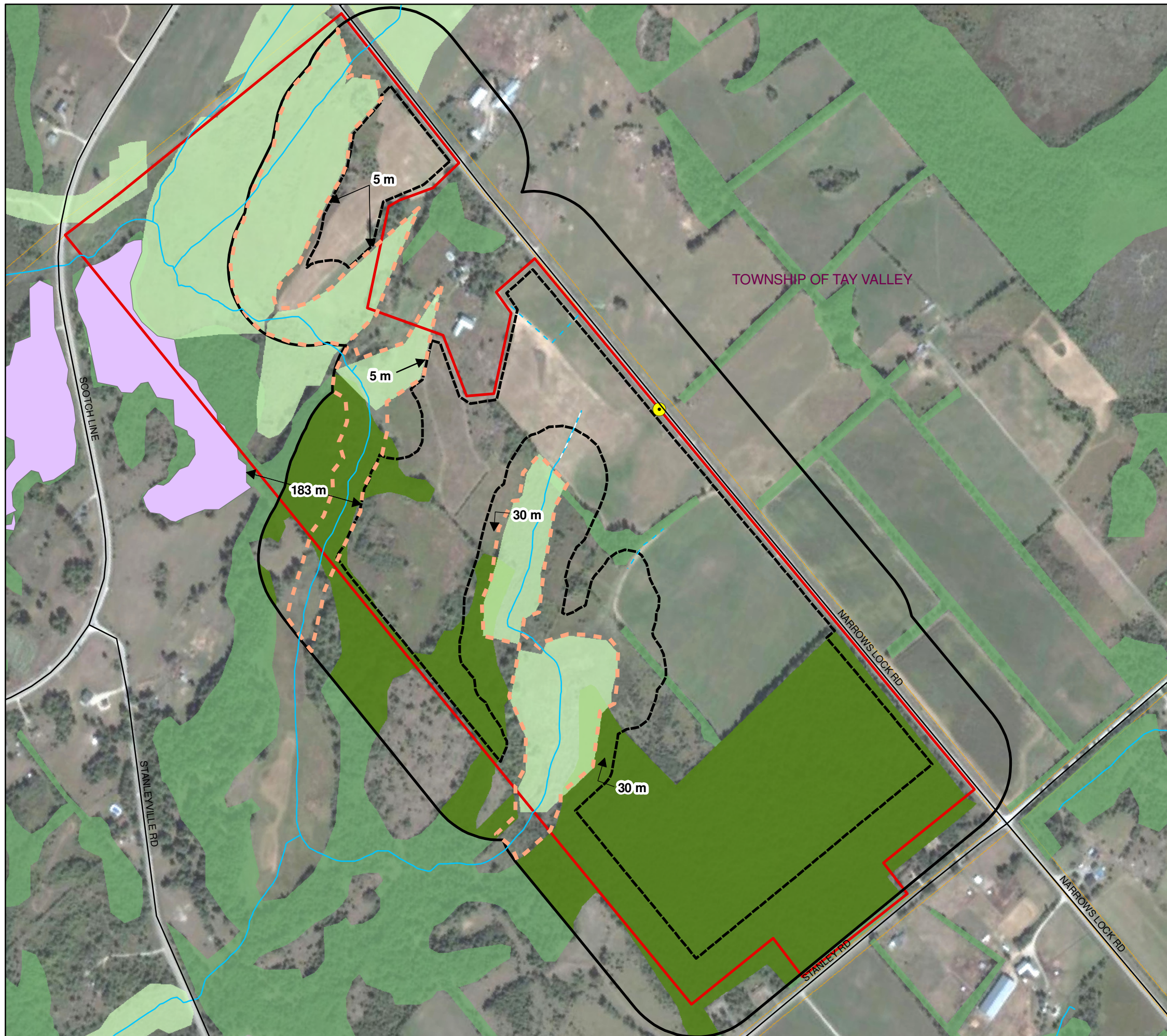
### **1.1.3 Evaluation of Significance Report**

Section 27(1) of the REA Regulation requires proponents of Class 3 solar projects to undertake an evaluation of significance for natural heritage features identified during the records review and site investigation that sets out

- a determination of whether the natural feature is
  - ◆ provincially significant
  - ◆ significant
  - ◆ not significant
  - ◆ not provincially significant
- a summary of the evaluation criteria or procedures used to make the determinations
- the name and qualifications of any person who applied the evaluation criteria or procedures.

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





**Legend**

- Road
- - - Grassed Waterway
- Watercourse
- ▭ Project Site
- ▭ Parcel
- ▭ Woodland
- ▭ Old Growth Forest (as identified by MNR)

**Significant Natural Features**

- ▭ Provincially Significant Wetland (assumed) / Amphibian Breeding Habitat
- ▭ Forest Providing a High Diversity of Habitat / Animal Movement Corridor / Significant Woodland
- - - Animal Movement Corridor / Western Chorus Frog Habitat / Eastern Ribbonsnake Habitat / Snapping Turtle Habitat / Northern Map Turtle Habitat

**Project Components**

- Connection Point With Existing Distribution Line
- - - Project Location
- ▭ 120 m from Project Location

**Notes:**

1. OBM and NRVIS data downloaded from LIO, with permission.
2. Old Growth Forest data based on information by Information Management & Planning Kemptville District.
3. Spatial referencing UTM NAD 83.
4. Satellite imagery from Google Earth Pro.

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▲ NORTH

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



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### **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:

- 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 significant natural heritage features noted in Section 1.1 and described in Section 1.2.

## **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 evaluation of significance (Hatch Ltd., 2010c).

The natural heritage features that were classified as significant are significant wildlife habitat that included

- all lands on and within 120 m of the Project location as significant habitat for Milksnake, a species of conservation concern, and as highly diverse areas
- wetlands/watercourse within 120 m of the Project location as a significant animal movement corridor and significant habitat for Western Chorus Frog, Eastern Ribbonsnake, Northern Map Turtle, and Snapping Turtle (species of conservation concern)
- wetland complexes within 120 m of the Project location as significant amphibian breeding habitat
- woodland on and within 120 m of the Project location as forest providing a high diversity of habitat
- all woodlands on the western and southern portion of the Project location, in conjunction with woodlands west of the Project location, as a significant animal movement corridor and significant woodland
- wetland areas are assumed to be provincially significant wetlands.

These significant natural heritage features and their location 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) and Section 6 describes how the Construction Plan Report (Hatch, 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 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.
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 Project Description Report (Hatch Ltd., 2010h). More detailed information can be found in the Construction Plan Report (Hatch Ltd., 2010d), Design and Operations Report (Hatch Ltd., 2010e) and Decommissioning Plan Report (Hatch Ltd., 2010f). The Site Layout from the Construction Plan Report (Hatch Ltd., 2010d) is provided in Appendix A to show the detailed components of the facility including solar panel, inverter, transformer and access road locations.

#### 3.1 Construction

Construction is anticipated to occur over an approximately 6-month period, likely commencing in April 2012 with commissioning scheduled for late January 2013. The activities associated with construction are summarized in Table 3.1.

**Table 3.1 General Description of Construction Activities (From Hatch Ltd., 2010h)**

Activity	Description
Access Road Construction	Activities associated with construction of internal access roads will include <ul style="list-style-type: none"> <li>• removal of topsoil and subsoil</li> <li>• placement of granular base (at least 30 cm)</li> <li>• installation of ditches and culverts</li> <li>• installation of sediment and erosion control features as necessary</li> <li>• replacement of topsoil on the temporary access roads if the roads are to be removed.</li> </ul>
Site Preparation	Activities associated with the site preparation will include <ul style="list-style-type: none"> <li>• consultation with construction contractor to determine the locations of topsoil and subsoil stockpiles where topsoil is stripped. Note that the piles will not be within 30 m of waterbodies and drainage routes</li> <li>• accumulation of uncut or shredded crops on the soil surface where topsoil is not stripped</li> <li>• installation of sediment and erosion control features as necessary.</li> </ul>
Installation of Support Structures	Activities associated with the installation of support structures will include <ul style="list-style-type: none"> <li>• creation of drilled holes for the purposes of stabilizing the support structures of the photovoltaic arrays</li> <li>• construction of foundations and/or support structures beneath transformers, inverters and photovoltaic panels</li> </ul>

Activity	Description
	<ul style="list-style-type: none"> <li>• installation of photovoltaic panels on fixed racking structures</li> <li>• inspection of foundation construction and of support structures prior to the installation of photovoltaic modules, and wiring.</li> </ul>
Underground Cable Installation	<p>Activities associated with underground cable installation will include</p> <ul style="list-style-type: none"> <li>• installation of direct current (DC) wiring 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 alternating current (AC)</li> <li>• utilization of a simple trenching device to install the cables; whereby a slot will be opened, the cable will be laid, and the soil replaced.</li> </ul>
Distribution Line Erection	<p>Activities associated with distribution line erection will include</p> <ul style="list-style-type: none"> <li>• construction of an underground distribution line which transports the electricity from the inverters to the transformer</li> <li>• erection of a overhead distribution connection from the transformer to transport the generated power from the Project to the 44-kV connection point</li> <li>• utilization of new or existing wooden poles.</li> </ul>
Site Security	<p>Activities associated with site security will include</p> <ul style="list-style-type: none"> <li>• installation of gate and fence on Project location</li> <li>• installation of additional security measures (e.g., security cameras, motion sensor flood lighting) if deemed necessary.</li> </ul>

### 3.2 Operation

The expected commercial operation date (COD) is January 16, 2013. The facility will operate 365 d/yr when sufficient solar radiation exists to generate electricity. The facility will be remotely monitored with no regular on-site employees. Maintenance is anticipated to occur quarterly. Maintenance activities will involve checking the structures and interconnections and cleaning the photovoltaic panels, as necessary. All maintenance materials such as hydraulic fluids, will be brought on site as required and no on-site storage will be made available. Rain and snowfall are anticipated to be sufficient for the cleaning of the panels. Should extra water be required it will be brought on site. The system does not produce waste of any type. All debris as a result of maintenance or cleaning will be removed from the site immediately by the contracted party. The Project will also be inspected whenever the power output is lower than anticipated as this would be indicative of a mechanical problem. The Project is expected to have a lifespan of 35 to 40 years.

### 3.3 Decommissioning

Decommissioning would occur when the decision has been made that it is no longer economically feasible to continue operation or refurbish generating equipment. It is anticipated that decommissioning would not occur for at least 35 years unless a power purchase agreement cannot be secured after the 20-yr duration of the Feed-In-Tariff (FIT) contract that has been obtained.

All decommissioning and site restoration activities would adhere to the requirements of appropriate regulatory authorities and would be conducted in accordance with all applicable federal, provincial

and municipal permits and other requirements. The decommissioning and restoration process comprises the following activities:

- removal of the scrap metal and cabling. Where possible, these materials will be recycled, with non-recyclable materials taken to an approved disposal site
- removal of support structures and foundations. 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, lands on the Project location will be restored to a condition suitable for agricultural use.

## 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 feature. Relevant environmental components of the significant wildlife habitats that may be impacted by the proposed Project include

- vegetation communities/wildlife habitat
- wildlife communities.

### 4.1 Vegetation Communities/Wildlife Habitat

Vegetation communities/wildlife habitat can be impacted by a number of activities, including the following:

- Direct encroachment on the feature – The removal of vegetation from the significant natural feature would have an impact on the vegetation community as a whole and the wildlife habitat that is provided therein.
- Fugitive dust generation – Fugitive dust generation has the potential to impact vegetation communities within the significant natural features as heavy dust loads on the photosynthetic surfaces of plants can retard growth and ultimately result in loss of the individual.
- Changes in surface water runoff altering the moisture regime of the feature – Alterations in surface water runoff may impact the moisture regime of the receiving significant natural feature. If the moisture regime of the receiving natural feature was altered significantly, the composition of this community may change as a result.

The potential negative effects and proposed mitigation measures associated with these activities are discussed by Project phase in the following sections.

#### **4.1.1 Construction Phase**

##### **4.1.1.1 Direct Encroachment on the Natural Heritage Features**

Direct encroachment will be required on the following significant natural heritage features:

- Woodland
- Forest Providing a High Diversity of Habitats
- Highly Diverse Areas
- Milksnake Habitat
- Woodlands supporting amphibian breeding habitat.

Potential impacts to these features and mitigation measures to minimize impacts are discussed further below by feature.

There will be no direct encroachment on the wetlands assumed to be provincially significant.

##### **4.1.1.1.1 Woodland/Forest Providing a High Diversity of Habitats/Animal Movement Corridor**

Vegetation removal will be required within portions of the significant woodland and associated forest providing a high diversity of habitats located on the Project location. In order to minimize the amount of vegetation removal required, work areas will be clearly flagged and workers will be made aware not to work beyond the extent of the cleared areas. All trees will be felled into the already cleared areas. Further, workers will be advised not to trespass beyond the bounds of the areas that had been previously flagged for vegetation removal.

At a maximum of approximately 14 ha (pending final Project design), the amount of vegetation removed will represent approximately 22% of the 64 ha woodland. As a result, the woodland will still maintain sufficient size, and maple/beech forests, and riparian protection, and there will be no clearing within areas of old growth forest, such that the woodland will remain a significant woodland. In addition, there will be no areas of woodland isolated as a result of Project construction.

Further, there will be no clearing within 30 m of the high water mark of the wetland and waterbody communities present within the woodland, such that the woodland will maintain water protection functions. In addition, woodland clearing will be completed from a relatively homogeneous portion of the community. As a result, the remaining woodland will maintain the functions of the forest providing a high diversity of habitats. Further, a shelter belt, such as a line of conifers, will be planted along the northern edge of the newly exposed woodland to protect trees previously sheltered from the elements.

Clearing within the woodland will remove the identified areas of non-significant forest interior habitat. Vegetation removed from the woodland and hedgerows will be placed around the perimeter of the Project location in order to provide increased habitat for wildlife species, such as snakes.



Construction of the Project will result in direct encroachment onto portions of the animal movement corridor found within the southern woodland. In order to maintain wildlife passage through the animal movement corridor, a treed buffer is planned within the southern woodland, such that there will be a minimum 50-m corridor present along the western and southern edges of the Project location, and a minimum 25-m wide corridor along the eastern edge (see Figure 1.1). The width of the corridor selected along the western and southern edge is consistent with narrow portions of corridor width in other portions of the corridor, while the 25 m corridor along the eastern portions of the Project location will permit connectivity to the narrow hedgerow community located east of Narrows Lock Road. Corridors of this width will permit safe wildlife passage within the corridor around the Project location, while also ensuring wildlife are not directed onto road shoulders/road surfaces prior to the existing crossing location.

The fenceline will be installed at the edge of the cleared area at 1 m from the dripline of the woodland. Periodic maintenance may be required along the fenceline to prevent woodland encroachment. This will consist of occasional (no more than once per year) tree removal to be conducted in the late fall to minimize impacts on wildlife populations.

As a result, there will be no impact on the significance of the woodland.

In order to compensate for the loss of woodland communities, Northland will enter into an agreement to provide funding to undertake a woodland restoration program. The woodland restoration program will consist of targeted tree planting on a number of properties in eastern Ontario to facilitate the restoration of an equal area of woodland as was removed from the Project location (currently anticipated to a maximum of approximately 14 ha, pending final design) with the following target criteria:

- a mix of native woodland tree species, preferably beech and maple, appropriately selected for the properties on which they will be planted
- an approximate planting density of approximately 2000 to 2400 trees per ha
- up to 3 ha of interior habitat provided by the plantings (defined as woodland area > 100 m from the woodland edge)
- plantings to enhance connectivity in the landscape and core habitat areas to enhance the function of existing woodlands to provide benefits to wildlife.

In association with the planting program, survival monitoring will be undertaken in years 1, 2 and 5 following the planting. The target survival rate at the end of year 5 is 60%. If this target is not met, Northland will fund re-fill plantings to ensure that the target survival is met.

The proposed woodland compensation will, in the long-term, result in the restoration of a similar amount of woodland with equal or better ecological functions (i.e., provision of interior habitat, connectivity and linkage and general wildlife habitat) than that which will be lost due to the Project.

#### 4.1.1.1.2 Highly Diverse Areas

As was noted within the Site Investigation Report, the Project location and surrounding area were identified as highly diverse areas as a result of the presence of agricultural lands, wetlands, and woodland communities.

There will be no removal of wetland communities as a result of the Project, while the loss of hayfields does not represent a significant loss from the planning area given the presence of more than 72,000 ha of pastureland and abandoned agricultural fields.

As is noted within Section 4.1.1.1.1, clearing within the woodland communities, was already determined to not be impactful on the forest providing a high diversity of habitats.

As a result, there will be no significant impact to the highly diverse areas present within this region.

#### 4.1.1.1.3 Woodlands Supporting Amphibian Breeding Habitat

There will be no construction within the wetland communities providing amphibian breeding habitat. As is discussed above, some clearing will occur within the woodland communities supporting the amphibian breeding habitat, however no removal will occur within 30 m of the amphibian breeding habitat, and the amphibian breeding habitat will remain connected to the woodland communities and larger wetland areas located off the Project location. Overall, tree removal planned from the woodland supporting amphibian breeding habitat is not anticipated to significantly impact the form or function of the amphibian breeding areas. Further, as construction activities will primarily occur during the day, while amphibian breeding occurs at night, there should be minimal disturbance of amphibian breeding communities.

#### 4.1.1.1.4 Milksnake Habitat

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 general use habitat for Milksnake. Wherever possible, construction will commence outside of the spring emergence period for Milksnake (i.e., April through May) when the species can be slow-moving. Given this avoidance time frame, it will not be possible to avoid construction during the period of movement to hibernacula, however ongoing construction on-site would be expected to deter large-scale movement of Milksnake across the Project location. Regardless, no specific habitat features for Milksnake, such as hibernation sites, were identified during the site investigations and the risk to Milksnake is considered to be low. Given that Milksnake are a habitat generalist and all lands in this area would represent suitable general use habitat, sufficient alternate habitat locations are available. Mitigation measures to avoid incidental take of Milksnake are identified within Section 4.2.1.

#### 4.1.1.2 *Project Construction near assumed Provincially Significant Wetland*

There are portions of the assumed Provincially Significant Wetland within 120 m of the Project location.

A minimum 5-m setback from the wetland community in agricultural areas, and a minimum 30-m setback in treed areas, will be in place to ensure impacts are minimized. It is not possible to move the Project location farther from the boundaries of this complex given existing constraints on space

on the Project location. Prior to construction, the boundary of the feature will be delineated, and the 5-m or 30-m setback marked off with staking/flagging spaced at distances of 20 m, and at any location where the work area boundary changes direction; this will ensure that the setback is preserved. Drainage and sediment and erosion controls are proposed within the Waterbodies Environmental Impact Study (Hatch 2011d) to ensure that there is no significant alteration in either the amount of surface water runoff, or potential sediment transport into the wetland from the Project location. At the completion of construction, the Project location will be vegetated with a mixture of grasses or other low-growing vegetation (mix to be determined), such that following establishment, there will be no variation in the amount of surface water runoff protection provided by the Project location when compared to the existing agricultural land. Though there may be some minor alteration in local microclimate at the edge of the feature as a result of Project construction, and ultimately operation, it is not expected that this will impact the form of the wetland community, and no special features or rare vegetation was reported from this area. Connectivity between the wetland community, and other communities of the wetland complex will remain intact.

The use of the mitigation measures identified above, will ensure that there is no impact to the assumed PSW, and associated significant wildlife habitats.

#### 4.1.1.3 *Fugitive Dust Generation*

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 dust generation will result in adverse effects on vegetation communities and associated wildlife habitat, since 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 generation on the Project location 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.

#### 4.1.1.4 *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). The study concluded that through the use of effective mitigation measures, there will be no significant change in surface water runoff as a result of Project construction. Measures will be employed to ensure that surface water runoff patterns and rates remain similar to existing conditions. Therefore, no alterations in the moisture regime in the significant natural features are anticipated to occur.

#### 4.1.2 **Operations Phase**

With the Project operating unmanned and regular maintenance only expected to occur periodically throughout the year, potential impacts on the significant natural feature are expected to be limited to changes in surface water runoff and presence of the Project within the significant wildlife habitat for Milksnake.

##### 4.1.2.1 *Surface Water Runoff*

Long-term site alterations associated with the operational phase of the Project that could potentially affect surface water runoff include

- long-term changes in land grading and ditches
- presence of impervious or less pervious surfaces
- changes in vegetation structure and density.

The potential negative effects and mitigation measures associated with these activities are discussed in the Waterbodies Environmental Impact Study (Hatch Ltd., 2010g). The study concluded that through the use of effective mitigation measures, there will be no significant change in surface water runoff as a result of Project operations. Measures will be employed to ensure that surface water runoff patterns and rates remain similar to existing conditions. Therefore, no alterations in the moisture regime in the significant features are anticipated to occur.

##### 4.1.2.2 *Presence of Project within Significant Wildlife Habitat for Milksnake*

The presence of Project components on significant wildlife habitat for Milksnake is not expected to impact the amount of available habitat. Milksnake are a habitat generalist and are commonly found around manmade structures, and as such it can be anticipated that the presence of the structures will not result in an impact on the amount of habitat available in the local area.

#### 4.1.2.3 *Vegetation Management within 30 m of Significant Wildlife Habitat in the Watercourse/Wetland*

Annual mowing of vegetation within 30 m of the watercourse and wetland will be required to maintain areas that currently exist in a grassland state in such a manner. Mowing will be timed for the late fall to ensure that any breeding wildlife species are no longer present within the subject areas. As a result, mowing will not have an impact on the animal movement corridor, or habitat for species of conservation concern that are found within the wetland and watercourse.

Any work on the fence present on the Project location boundary will be conducted from the Project location side of the fence (i.e., not within 30 m of the wetland communities). Therefore any fence maintenance required will not impact these habitats.

#### 4.1.3 **Decommissioning Phase**

Certain decommissioning activities will be similar to those activities that occurred during the construction phase of the Project, and as such mitigation measures from the construction phase will be similar to those employed in the decommissioning phase.

##### 4.1.3.1 *Fugitive Dust Generation*

The potential for dust generation during decommissioning will be the same as that previously discussed for construction (see Section 4.1.1.2). The mitigation measures previously identified with respect to construction will also be effective at mitigating potential impacts during decommissioning.

##### 4.1.3.2 *Surface Water Runoff*

Short-term activities and long-term site alterations associated with the decommissioning of the Project that could potentially affect surface water runoff include

- long-term changes in land grading
- changes in vegetation structure and density.

The potential negative effects and mitigation measures associated with these activities are discussed in the Waterbodies Environmental Impact Study (Hatch Ltd., 2010g). The study concluded that decommissioning will restore the Project location to pre-existing conditions and there will therefore be no long-term effect on surface water runoff and therefore, no effect on the significant natural feature.

##### 4.1.3.3 *Restoration of Significant Wildlife Habitat for Milksnake*

During decommissioning, the Project location will be restored to pre-existing conditions, returning the Project area to use by Milksnake similar to that which is already present on site.

## 4.2 **Wildlife Communities**

Some project activities (e.g., tree clearing and solar panel installation) will occur within the significant wildlife habitat, causing direct impacts to the wildlife present within this feature.

#### 4.2.1 **Construction Phase**

Major activities, such as tree clearing, land grading, excavation, construction of access roads and trenching will be scheduled to occur outside of the breeding bird period (generally May through July) to the greatest extent possible so that impacts to wildlife species breeding on the Project location, such as nesting birds, will be minimized. If major activities are required during the breeding wildlife period, the areas potentially impacted will be searched by a trained biologist within 48 hours of the proposed activity in order to determine if birds are currently nesting in these areas. If nests are found, work will be suspended within 100 m of the nest location until such time as the nest is successful or abandoned. Use of these mitigation measures is anticipated to prevent potential effects to nesting wildlife.

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 area will be completed to search for amphibians and reptiles 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. If wildlife are observed on the Project location, they will be either directed off of the Project location by the worker (without the use of vehicles) or collected by a designated employee, who has been provided with protocols for the safe handling and transport of wildlife, and transported to the nearest available location off site and released.

Some incidental take may still occur during construction; however, levels should be negligible. Known occurrences of incidental take will be documented in the monthly environmental report. If a species of conservation concern is noted, work within the area will be ceased immediately, and the Ministry of Natural Resources (MNR)/Environment Canada (EC) 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 species of conservation concern 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. Wildlife populations within the significant natural features adjacent to the Project location may retreat from these areas as a result of the disturbance, and some restriction of movement within the animal movement corridor may occur during work in proximity to that area. It is not possible to mitigate these effects, however work will occur across a single year and therefore impacts will be restricted to that year. As a result, this impact will not result in noticeable effects to wildlife populations.

It is expected that wildlife populations that typically occurred on the Project location will abandon these sites throughout the duration of construction. In respect of Milksnake, Milksnake may temporarily retreat from these areas during construction as a result of the disturbance; however, as they are habitat generalists, this is not expected to impact the local population.

#### 4.2.2 **Operations Phase**

As regular maintenance is anticipated to occur infrequently throughout the year, this would be consistent with existing disturbances on the Project location from agricultural operations.

Mowing of vegetation beneath and around the solar panels, if required, may also result in incidental take. Mowing will be scheduled to occur outside of the breeding bird period. If these activities are required during the breeding period, the site will be searched for breeding birds prior to undertaking mowing activities. If nesting locations are identified, mowing will not be conducted within 25 m of the proposed location, until such time as the nest is successful or abandoned. Known occurrences of incidental take will be reported and the species impacted will be determined. If the species is determined to be a species of conservation concern, work within the area will be ceased immediately, and the MNR/EC 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 further species of conservation concern present in the area. Milksnake are habitat generalists and may be impacted by incidental take.

As a result of the low level of disturbance associated with the Project (infrequent nature of site investigation, minimal noise produced by the Project equipment) ,operations are not expected to impact wildlife communities within the significant wildlife habitat features within 120 m of the Project location.

#### **4.2.3 Decommissioning Phase**

During the decommissioning phase, disturbances present in the area will be similar to those that may occur during the construction phase as described in Section 4.2.1. In order to minimize potential impacts to wildlife communities of the significant natural features, decommissioning will be scheduled to occur outside of breeding wildlife period. Though there may be some avoidance of the significant natural features near the Project location during decommissioning, these effects are temporary, and following decommissioning the site will be restored to existing conditions.

## **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 feature have been reproduced here, in Table 5.1.

The monitoring proposed in Table 5.1 will confirm 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.

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

Negative Effect	Mitigation Strategy	Performance Objective	Monitoring Plan				Contingency Measures	
			Methodology	Monitoring Locations	Frequency	Rationale		Reporting Requirements
<b>Construction Phase</b>								
Potential impacts to nesting birds	Clearing/land grading to be conducted outside of breeding bird period.  If not possible, areas to be cleared to be searched for nests prior to clearing.	Preventing impacts to nesting birds.	Confirmation of timing of clearing. If searches are required, area searches by a trained biologist will be conducted.	Throughout areas to be cleared.	Confirmation of clearing progress to occur weekly during clearing in order to ensure completed prior to breeding bird period. If clearing required during breeding bird period, searches will be conducted within 48 hours of clearing activities.	The use of this monitoring will confirm that clearing is either conducted outside of the breeding bird period, or that nesting birds will be identified prior to clearing being undertaken.	Reported in monthly environmental monitoring report during construction.	If nesting birds are identified, work will be suspended within 100 m of the nest until the nesting attempt is successful or abandoned.
Wildlife becoming trapped within the fence	Visual inspection following completion of fence and removal of wildlife.	Ensure all trapped wildlife species are removed from the Project location.	Visual search of the Project location for trapped wildlife species.  Any wildlife observed will be either directed off of the Project location or collected by a designated employee and transported to the nearest available location off site and released.	Entire Project location within the fence.	Once following completion of fence.	Visual search will ensure all trapped wildlife species are detected and removed.	Reported in monthly environmental monitoring report following completion of search.	If any wildlife are recorded trapped within the fence following this activity, previously described protocols will be followed to remove wildlife species from the Project location.
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 either directed off of the Project location or collected by a designated employee and transported to the nearest available location off-site and released.	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/EC.	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	Minimize fugitive dust from the construction	Visual monitoring of visible dust plumes	Throughout construction site.	Periodically during all construction activities.	Visual dust monitoring would identify if dust	Reported in monthly environmental	Dust control measures implemented as necessary to prevent/minimize

Negative Effect	Mitigation Strategy	Performance Objective	Monitoring Plan				Contingency Measures	
			Methodology	Monitoring Locations	Frequency	Rationale		Reporting Requirements
	practices to prevent fugitive dust.	site.	during construction.			plumes are an issue and where their source may be.	monitoring report during construction.	dust generation.
<b>Operations Phase</b>								
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.	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/EC.	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.
<b>Decommissioning Phase</b>								
Incidental take of wildlife	Daily visual monitoring of work areas and decommissioning equipment prior to start of work.  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 either directed off of the Project location or collected by a designated employee and transported to the nearest available location off-site and released.	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/EC	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.

## 6. Construction Plan Report

The REA Regulation requires proponents of Class 3 solar projects to prepare a Construction Plan Report (CPR). Hatch completed the CPR for this Project (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 natural features is the same as that discussed in this EIS. Additional mitigation is proposed to address negative effects during construction not related to 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.

## 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 are significant wildlife habitat features and a significant woodland found on and within 120 m of the Project location, and an assumed provincially significant wetland found 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 the 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.

## 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.

DeJong-Hughes, J., Moncreif, J.F., Vorhees, W.B. and J.B. Swan. 2001. Soil Compaction Causes, Effects and Control. Regents of the University of Minnesota. Available on-line at <http://www.extension.umn.edu/distribution/cropsystems/DC3115.html>. Accessed November 28, 2007.

Hatch Ltd. 2010a. North Burgess Solar Project – Natural Heritage Records Review Report. Prepared for Northland Power Inc. August 2010.

Hatch Ltd. 2010b. North Burgess Solar Project – Natural Heritage Site Investigations Report. Prepared for Northland Power Inc. August 2010.

Hatch Ltd. 2010c. North Burgess Solar Project – Evaluation of Significance Report. Prepared for Northland Power Inc. August 2010.

Hatch Ltd. 2010d. North Burgess Solar Project – Construction Plan Report. Prepared for Northland Power Inc. August 2010.

Hatch Ltd. 2010e. North Burgess Solar Project – Design and Operations Report. Prepared for Northland Power Inc. August 2010.

Hatch Ltd. 2010f. North Burgess Solar Project – Decommissioning Plan Report. Prepared for Northland Power Inc. August 2010.

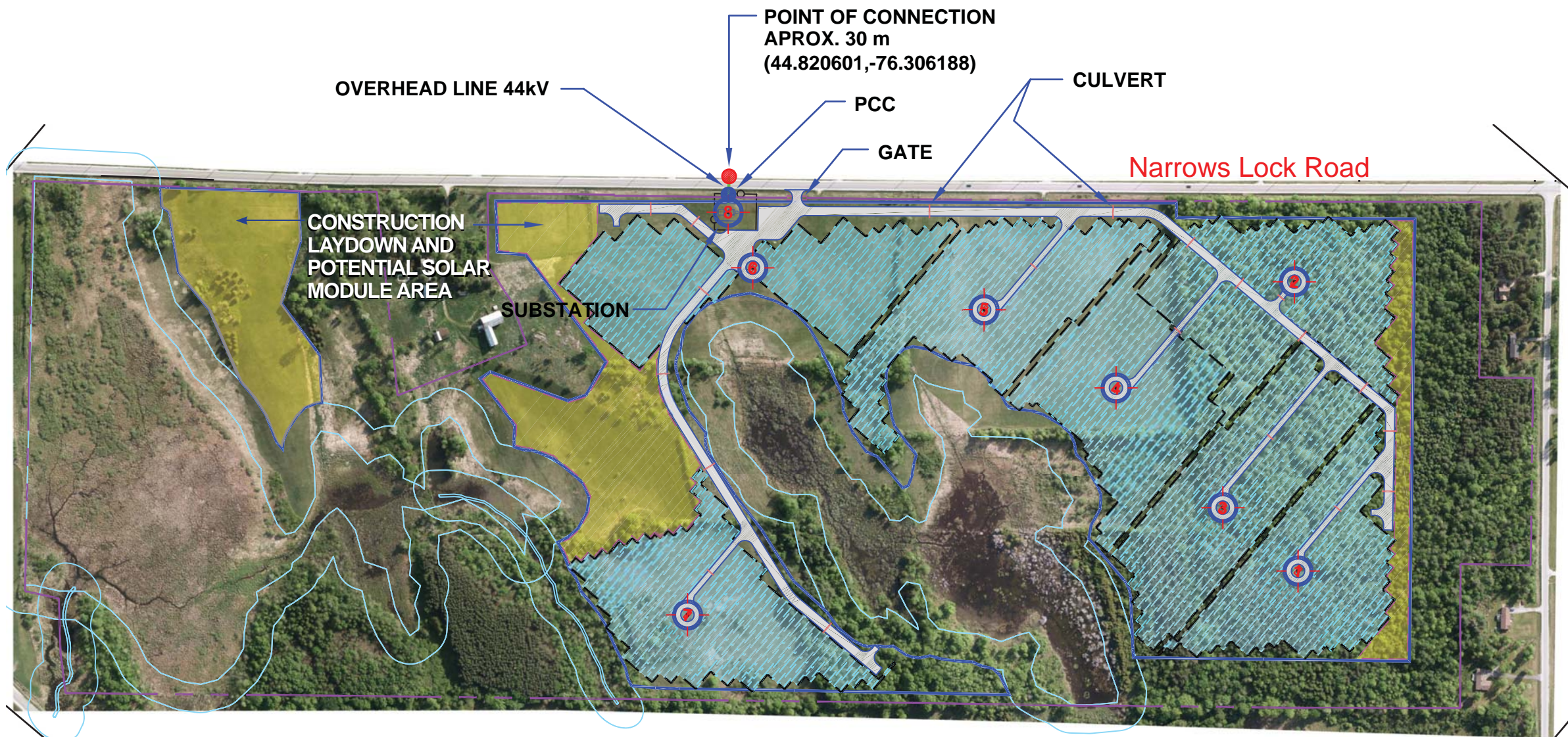
Hatch Ltd. 2010g. North Burgess Solar Project – Waterbodies Environmental Impact Study. Prepared for Northland Power Inc. August 2010.

Hatch Ltd. 2010h. North Burgess Solar Project – Project Description Report. Prepared for Northland Power Inc. May 2010.










# Appendix A



## Site Plan

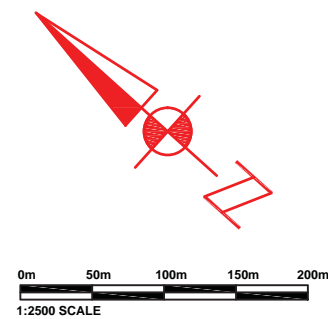




**LEGEND:**

-  GRAVEL ACCESS ROAD
-  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 MODULES AREA
-  PCC (POINT OF COMMON COUPLING)
-  114 RACK IN ONE GROUP, 3 STRINGS OF 18 PANELS PER RACK COMBO (SET @ 30° TILT WITH 8.0 METERS PITCH SPACING) 43,092 PANELS USED NOMINAL CAPACITY: 12 MW<sub>DC</sub> OR 10 MW<sub>AC</sub>

  2 x 800 kVA INVERTER, 1 x 1600 kVA TRANSFORMER



REVISIONS			
NO	DATE	SYMBOL	REMARKS
P0	DEC 2010		ISSUED FOR CONSTRUCTION PLAN REPORT
P1	JULY 2011		LAYOUT & INVERTER LOCATION CHANGED

STAMP	
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PROJECT  
**NORTHLAND POWER SOLAR NORTH BURGESS**

DRAWN BY	TIEN PHAM	VERIFIED BY	
SCALE	N.T.S.	VERIFIED BY	
DATE	DEC 2010	APPROVED BY	

ISSUED FOR TENDER	
PROJECT No.	
TITLE	SOLAR FARM PROJECT SITE PLAN
DRAWING No.	SP-02 (N. BURGESS) Rev.P1

**PRELIMINARY LAYOUT  
NOT FOR CONSTRUCTION**