



**NORTHLAND
POWER**

Rideau Lakes Solar Project

Natural Heritage Environmental Impact Study

August 15, 2011



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

Natural Heritage
Environmental Impact Study

Rideau Lakes Solar Project

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Project Report

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**Northland Power Inc.
Rideau Lakes Solar Project**

Natural Heritage Environmental Impact Study

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1. Introduction

Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. (hereinafter referred to as “Northland”) is proposing to develop a 10-megawatt (MW) solar photovoltaic project titled the Rideau Lakes Solar Project (hereinafter referred to as the “Project”). The Project will be located on approximately 50 hectares (ha) of land, located in the Township of Rideau Lakes, within the United Counties of Leeds and Grenville (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 natural heritage features.

1.1 Renewable Energy Approval Legislative Requirements

Per Section 4 of the REA Regulation, ground-mounted solar facilities with a nameplate 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 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
- 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).

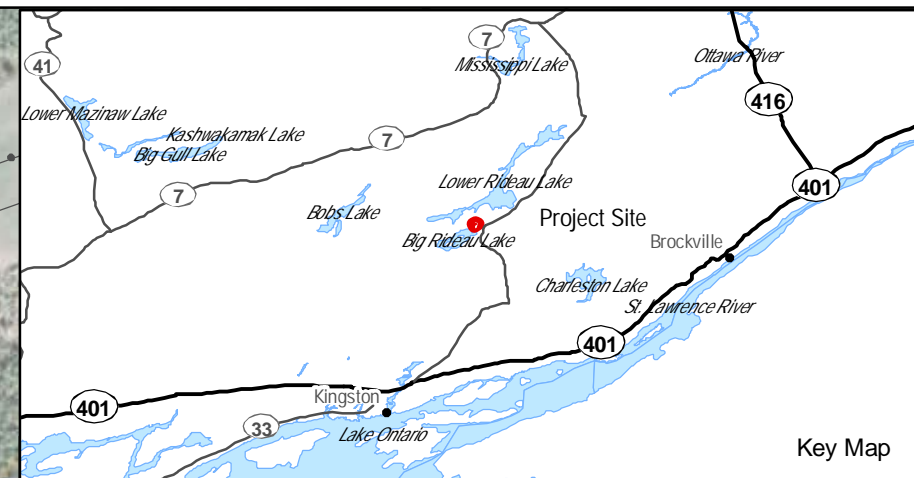
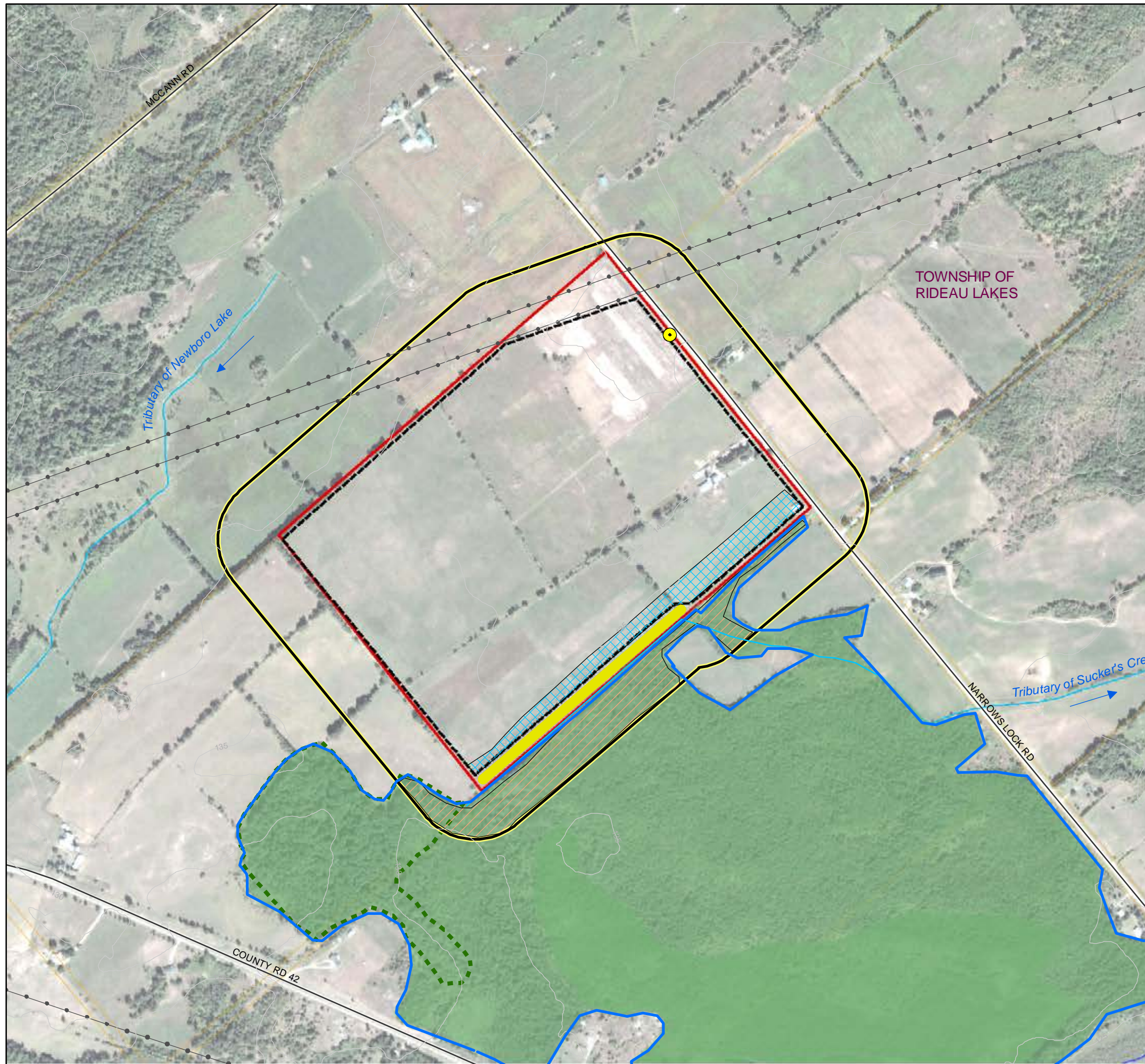
The Natural Heritage Site Investigation Report (Hatch Ltd., 2010b) was prepared to meet these requirements.

1.1.3 Evaluation of Significance Report

Section 27(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.

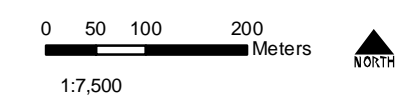
The Evaluation of Significance Report (Hatch Ltd., 2010c) for the natural features identified on and within 120 m of the Project location was prepared to meet these requirements.



Key Map

Legend

- Roads
 - Transmission Line
 - Topographic Contour (5m interval)
 - Watercourse
 - ▭ Available Lands
 - ▭ 120m from Project Location
 - ▭ Parcels
- Significant Natural Heritage Features**
- Significant Woodland
- Significant Wildlife Habitat**
- ▭ Milksnake Habitat
 - ▭ Old Growth Forest
 - ▭ OvenbirdHabitat/Highly Diverse Areas/Animal Movement Corridor
- Project Components**
- Connection Point with Distribution Line
 - ▭ Project Location
 - ▭ 60 m Buffer from Woodland (Construction)
 - ▭ Annual Vegetation Management Zone (Operations)



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.
Rideau Lakes Solar Energy 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.

1.2 Background Information on Natural Heritage Features

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

- All lands on and within 120 m of the Project location – potential significant wildlife habitat for Milksnake
- Woodland South of the Project location – significant woodland, and significant habitat for Ovenbird, significant old-growth forest, significant highly diverse areas, and significant animal movement corridor.

These significant natural heritage features and their locations in relation to the Project development area 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 2011 with commissioning scheduled for late October 2011. The activities associated with construction are summarized in Table 3.1.

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

| Activity | Description |
|------------------------------------|---|
| Access Road Construction | <p>Activities associated with construction of internal access roads will include</p> <ul style="list-style-type: none"> • removal of topsoil and subsoil • placement of granular base (at least 30 cm) • installation of ditches and culverts • installation of sediment and erosion control features as necessary • replacement of topsoil on the temporary access roads if the roads are to be removed. |
| Site Preparation | <p>Activities associated with the site preparation will include</p> <ul style="list-style-type: none"> • consultation with the landowner 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. • accumulation of uncut or shredded crops on the soil surface where topsoil is not stripped • removal of trees and shrubs (from hedgerows) as required [to occur outside of breeding bird period (May through July)] • installation of sediment and erosion control features as necessary. |
| Installation of Support Structures | <p>Activities associated with the installation of support structures will include</p> <ul style="list-style-type: none"> • creation of drilled holes for the purposes of stabilizing the support structures of the photovoltaic arrays • construction of foundations and/or support structures beneath transformers, inverters and photovoltaic panels • installation of photovoltaic panels on fixed racking structures • inspection of foundation construction and of support structures prior to the installation of photovoltaic modules, and wiring. |
| Underground Cable Installation | <p>Activities associated with underground cable installation will include</p> <ul style="list-style-type: none"> • 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). • 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. |

| Activity | Description |
|----------------------------|---|
| Distribution Line Erection | Activities associated with distribution line erection will include <ul style="list-style-type: none"> • construction of an underground distribution line which transports the electricity from the inverters to the transformer • erection of a overhead distribution connection from the transformer to transport the generated power from the Project to the 44-kV connection point • utilization of new or existing wooden poles. |
| Site Security | Activities associated with site security will include <ul style="list-style-type: none"> • installation of gate and fence on Project location (in the vicinity of the woodland, the fence will be installed 30 m away from the woodland). • installation of additional security measures (e.g., security cameras, motion sensor flood lighting) if deemed necessary. |

3.2 Operation

The expected commercial operation date (COD) is October 19, 2011. 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. Maintenance activities associated with maintaining the fence, if required, will be conducted from the Project side (i.e., within the fence). 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.

Unless access is required for annual vegetation control, there will be no activities occurring within the 30-m vegetated buffer from the woodland south of the Project location.

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 fencing, scrap metal and cabling. Where possible, these materials will be recycled, with non-recyclables taken to an approved disposal site.

- removal of support structures and foundations unless the landowner requests otherwise. These materials will be recycled where possible.
- site cleanup and re-grading to original contours, and any damage to tile drainage system to be repaired/replaced.
- planting of leguminous crops to provide a rapid return of nutrients and soil structure.

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

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 effects on the land could negatively affect the significant natural features. Relevant environmental components of the significant woodland and wildlife habitat 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 features 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 features. If the moisture regime of the receiving natural features was altered significantly, the composition of these communities 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.

Impacts are addressed below with respect to the habitat structure alone, while impacts to the wildlife communities are addressed within Section 4.2.

4.1.1 Construction Phase

4.1.1.1 Direct Encroachment on the Natural Heritage Features

Construction of the Project will require direct encroachment onto the significant wildlife habitat for Milksnake that is present on the Project location. This will result in a loss of general use habitat for Milksnake during construction.

The woodland south of the Project location, and associated significant wildlife habitats, will be protected by a 30-m buffer associated with the setback from the watercourse located along the edge of this feature. This setback will ensure direct encroachment on the woodland, and further, impacts to the wildlife habitat features contained within the woodland does not occur.

4.1.1.2 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.

4.1.1.3 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 moisture regime in the significant wildlife habitat 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 features are expected to be limited to changes in surface water runoff and presence of solar panels within Milksnake habitat.

There are no impacts to the habitat structures of the significant woodlands and associated significant wildlife habitats within 120 m of the Project location during operations, however, potential impacts to wildlife communities present within these features are addressed in Section 4.2.

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 moisture regime in the significant wildlife habitat 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.

4.1.3 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 effect the natural features.

4.2 Wildlife Communities

4.2.1 Construction Phase

As construction will occur during the wildlife breeding season, wildlife species breeding on the Project location, such as nesting birds, may be directly impacted by construction activities resulting in potential loss or abandonment of nest attempts or incidental take of wildlife species. In order to minimize impacts on wildlife species, major construction activities with the potential to disturb breeding wildlife will be timed wherever possible to occur outside of the breeding bird period (generally May through July). Such activities will include land grading, excavations, construction of access roads, and trenching. If these 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.

The installation of the fence may trap wildlife within the Project location, such as deer and coyote species that may venture from the animal movement corridor. Once the fence is completed, a visual search of the Project location will be conducted to search for any trapped wildlife species. If species are observed, they will be either directed off of the Project site (i.e., in the case of deer) 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.

At any point in time during construction, if wildlife are observed in a work area, 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.

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 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 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 woodland adjacent to the Project location may retreat from the immediate vicinity of the Project as a result of the disturbance during construction. Wherever possible, work within 100 m of the edge of the woodland will be conducted outside of the breeding bird period (generally May through July). However, if this is not possible, impacts from construction would be expected to be restricted to the edge of the feature given the 30-m setback from the woodland associated with the Project. Woodland edge habitats are generally considered to be of poor quality for woodland breeding species given increased risk of predation. Overall, no impact on woodland form or function would be anticipated as a result of this effect on the woodland edge.

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 relatively infrequently during the year, this would be consistent with existing disturbances on the Project location due to agricultural operations.

In order to minimize the potential for incidental take of wildlife, speeds on access roads of the Project location will be restricted. Further, visual monitoring of the access roads will be completed. 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.

As the Projects are unmanned, and little noise disturbance is produced as a result of their operation, given the 30-m setback from the woodland south of the Project location, no impact on the form or function of the significant woodland or the significant wildlife habitats found within are expected.

Annual mowing may also be required within 30 m of the significant woodland and associated wildlife habitats. Mowing within these areas will be scheduled for late fall in order to ensure that activities occur outside of the wildlife breeding period.

Mowing of vegetation beneath and around the solar panels, if required, may result in incidental take. 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 through incidental take.

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 on or 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 features 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.

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 |
| Construction Phase | | | | | | | | |
| 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. |
| 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 site 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. |
| Disruption of bird breeding within significant woodland | Construction activities within 100 m timed outside of bird breeding period (generally May through July), wherever possible. | Minimize impacts to nesting birds. | Inspection to ensure construction occurs outside of timing restriction. | Within 100 m of significant woodland. | Periodically during all construction activities. | Inspection will ensure restriction window is followed. | Reported in monthly environmental monitoring report during construction. | If this timing restriction cannot be observed, a 60-m buffer from the woodland will be in place to ensure that there will be a negligible impact on nesting birds within the woodland. |
| 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 | | | | | | | | |
| Disruption of bird breeding within significant woodland | Mowing within 30 m of the woodland will be timed for late fall | Minimize impacts to nesting birds | Inspection to ensure activities occur outside of timing restriction | Within 30 m of significant woodland. | Ongoing during maintenance activities. | Inspection will ensure restriction window is followed. | No requirement. | No contingency measure 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/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. |
| Decommissioning Phase | | | | | | | | |
| Disruption of bird breeding within significant woodland | Decommissioning activities within 100 m timed outside of bird breeding period (generally May through July). | Minimize impacts to nesting birds. | Inspection to ensure decommissioning occurs outside of timing restriction. | Within 100 m of significant woodland. | Periodically during all decommissioning activities. | Inspection will ensure restriction window is followed. | Reported in monthly environmental monitoring report during decommissioning | None required. Decommissioning will occur outside of the breeding bird period. |
| 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 is a significant woodland and associated significant wildlife habitats found within 120 m of the Project location, while there is significant wildlife habitat for Milksnake found on and 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. Potential negative effects are associated with

- alterations to vegetation communities/wildlife habitat as a result of
 - ◆ direct encroachment on the features
 - ◆ fugitive dust generation
 - ◆ changes to surface water runoff
- disturbance of wildlife communities as a result of Project activities.

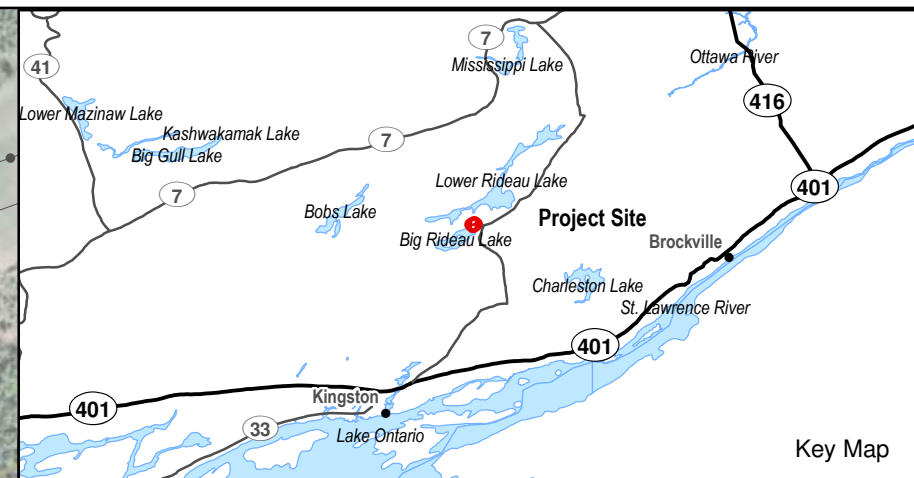
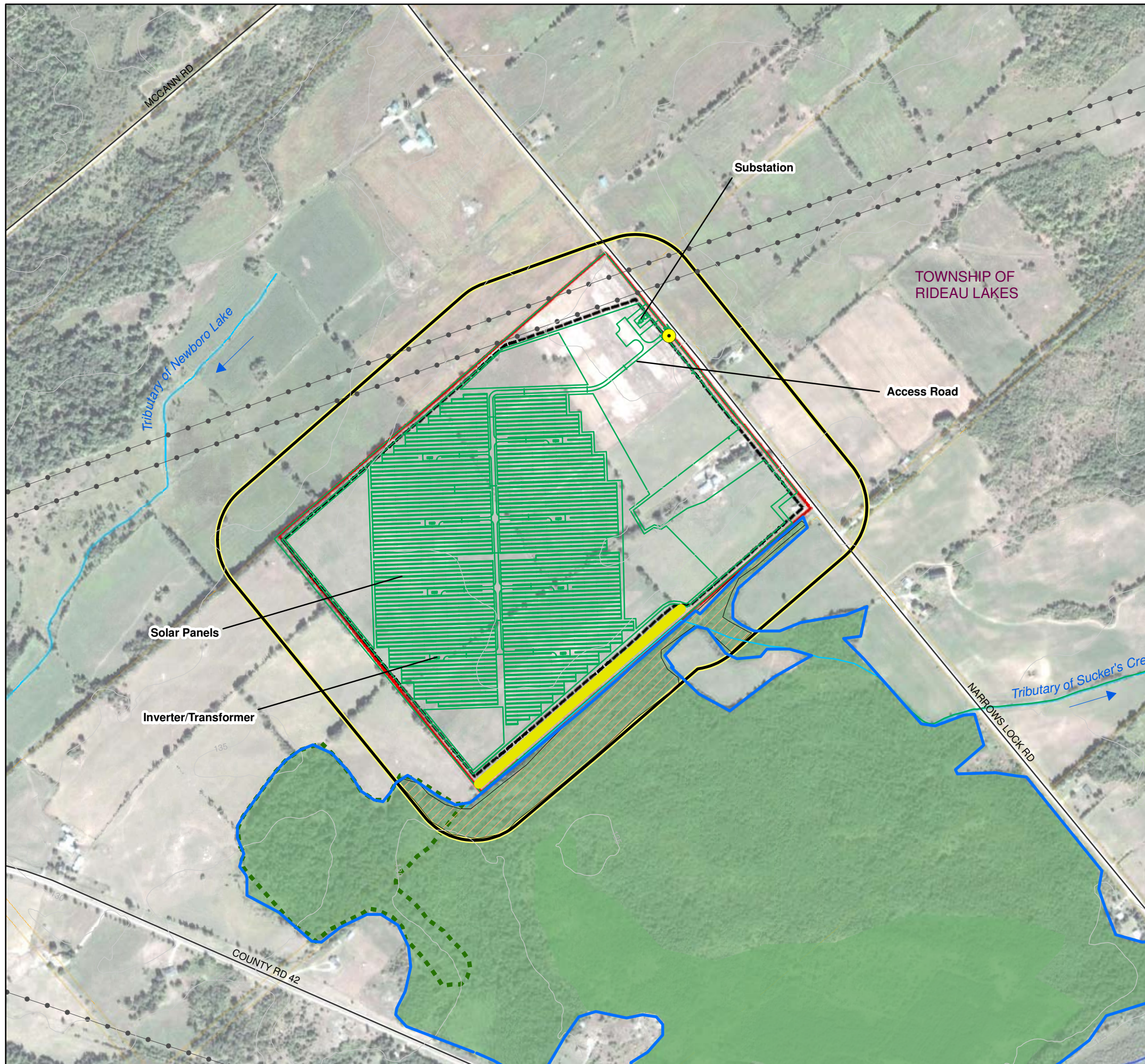
Mitigation measures have been proposed to prevent these effects from occurring or minimize the magnitude, extent, duration and frequency in the event that they do occur. The primary mitigation measure that will prevent adverse effects on the natural features is avoidance of direct encroachment onto the features themselves, clear demarcation of areas where vegetation removal is required, and timing of activities to avoid periods of increased use by wildlife. 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., J. F. Moncreif, W. B. Vorhees, 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. Rideau Lakes Solar Project – Natural Heritage Records Review Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. July 2010.
- Hatch Ltd. 2010b. Rideau Lakes Solar Project – Natural Heritage Site Investigations Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. July 2010.
- Hatch Ltd. 2010c. Rideau Lakes Solar Project – Natural Heritage Evaluation of Significance Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. July 2010.
- Hatch Ltd. 2010d. Rideau Lakes Solar Project – Construction Plan Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. July 2010.
- Hatch Ltd. 2010e. Rideau Lakes Solar Project – Design and Operations Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. July 2010.
- Hatch Ltd. 2010f. Rideau Lakes Solar Project – Decommissioning Plan Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. July 2010.
- Hatch Ltd. 2010g. Rideau Lakes Solar Project – Waterbodies Environmental Impact Study. Prepared for Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. July 2010.
- Hatch Ltd. 2010h. Rideau Lakes Solar Project – Project Description Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Rideau Lakes L.P. July 2010.

Appendix A

Site Layout



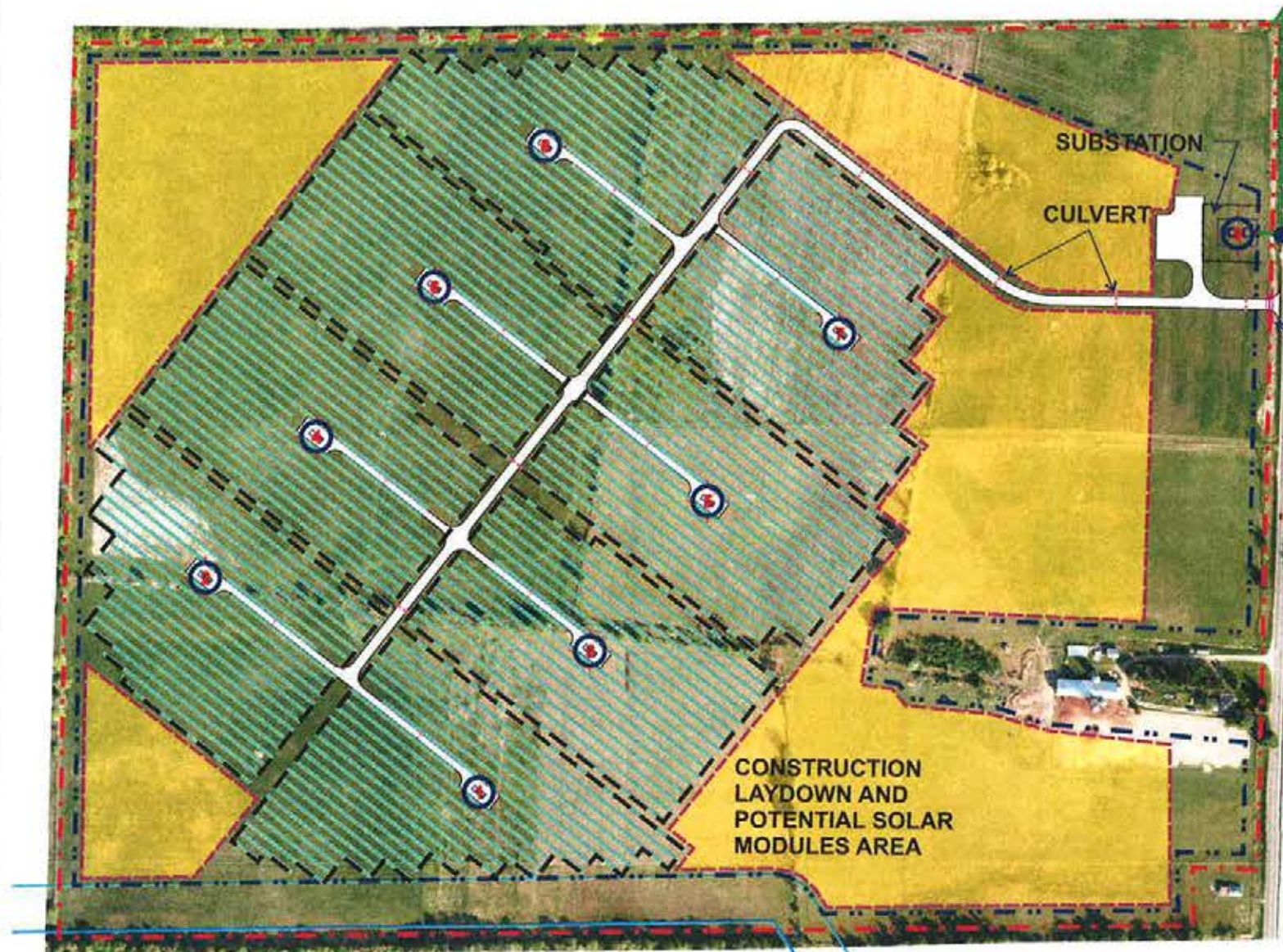
- Legend**
- Roads
 - Transmission Line
 - Topographic Contour (5m interval)
 - Watercourse
 - ▭ Available Lands
 - ▭ 120m from Project Location
 - ▭ Parcels
- Significant Natural Heritage Features**
- Significant Woodland
- Significant Wildlife Habitat**
- ▭ Milksnake Habitat
 - ▭ Old Growth Forest
 - ▭ OvenbirdHabitat/Highly Diverse Areas/Animal Movement Corridor
- Project Components**
- Connection Point with Distribution Line
 - ▭ Project Location
 - ▭ Annual Vegetation Management Zone (Operations)














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

TO POINT OF CONNECTION
 APROX. 960 m
 (44.675834, -76.280572)

| REVISIONS | | | |
|-----------|----------|--------|--------------------------------------|
| NO | DATE | SYMBOL | REMARKS |
| P0 | NOV 2010 | | ISSUED FOR CONSTRUCTION IN AN REPORT |
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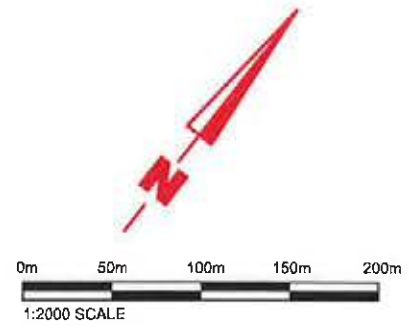


LEGEND:

-  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}
-  2 x 625 kVA INVERTER
1 x 1250 kVA TRANSFORMER

County Road 14

CONSTRUCTION LAYDOWN AND POTENTIAL SOLAR MODULES AREA



| | |
|-------|--|
| STAMP | |
| | |

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PROJECT
NORTHLAND POWER SOLAR RIDEAU LAKE

| | |
|--------------------|-------------|
| 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 (RIDEAU LAKE) Rev.P0

**PRELIMINARY LAYOUT
 NOT FOR CONSTRUCTION**