



**NORTHLAND  
POWER**

# Glendale Solar Project

## Draft Water Body Site Investigations Report

July 15, 2011

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

DRAFT Water Body Site  
Investigation Report

Glendale Solar Project

H334844-0000-07-124-0209

Rev. 0

July 15, 2011

**Disclaimer**

This report has been prepared solely for the use of Northland Power Inc., who is submitting this document to the Ministry of the Environment as part of the Renewable Energy Approval process. This document is in DRAFT form and subject to further revision. The content of this document is not intended for the use of, nor is it intended to be relied upon by any person, firm or corporation.

Project Report

July 15, 2011

**Northland Power Inc.  
Glendale Solar Project**

**DRAFT Water Body Site Investigation Report**

**Table of Contents**

**1. Introduction ..... 3**

    1.1 Project Description ..... 3

    1.2 Legislative Requirements..... 3

**2. Summary of Water Body Records Review Results ..... 4**

**3. Site Investigation Methodology ..... 5**

    3.1 Site Investigation 1 ..... 5

        3.1.1 Date, Time and Duration of Site Investigation 1 ..... 5

        3.1.2 Weather Conditions During Site Investigation 1 ..... 5

    3.2 Site Investigation 2 ..... 5

        3.2.1 Date, Time and Duration of Site Investigation 2 ..... 5

        3.2.2 Weather Conditions During Site Investigation 2 ..... 6

    3.3 Name and Qualifications of Person Conducting Site Investigation..... 6

    3.4 Survey Methods ..... 7

**4. Results of Site Investigation..... 7**

    4.1 Permanent or Intermittent Streams..... 7

        4.1.1 Tributary of Raisin River ..... 7

        4.1.2 Watercourse A ..... 8

**5. Conclusions ..... 8**

**6. References..... 8**

**Appendix A Site Investigation Field Notes**

## List of Tables

Table 2.1 Summary of Records Review Determinations ..... 5

## List of Figures

Figure 4.1 Water Body and Project Boundaries ..... 9

## 1. Introduction

### 1.1 Project Description

Northland Power Solar Glendale L.P. (hereinafter referred to as “Northland”) is proposing to develop a 10-megawatt (MW) solar photovoltaic (PV) Project titled Glendale Solar Project (hereinafter referred to as the “Project”). The Project location will be on approximately 45 hectares (ha) of land, in the Township of South Glengarry, within the United Counties of Stormont, Dundas and Glengarry.

### 1.2 Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the “REA Regulation”) made under the *Environmental Protection Act* identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. 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.

Section 31 of the REA Regulation requires proponents of Class 3 solar projects to undertake a water site investigation for the purpose of determining

- a) whether the results of the analysis summarized in the (Water Body Records Review) report prepared under Subsection 30(2) are correct or require correction, and identifying any required corrections
- b) whether any additional waterbodies exist, other than those that were identified in the (Water Body Records Review) report prepared under Subsection 30(2)
- c) the boundaries, located within 120 m of the Project location, of any water body that was identified in the records review or the site investigation
- d) the distance from the Project location to the boundaries determined under clause (c).

The REA Regulation has specific requirements if designated lake trout lakes are present within 300 m of the Project area. These requirements were not deemed applicable to the Project as no such lakes were found within 300 m of the Project location during the Water Body Records Review (Hatch Ltd., 2010a).

Waterbodies are defined in Section 1(1) of the REA Regulation to include a lake, a permanent stream, an intermittent stream or a seepage area, but does not include

- a) grassed waterways
- b) temporary channels for surface drainage, such as furrows, or shallow channels that can be tilled or driven through
- c) rock chutes and spillways
- d) roadside ditches that do not contain a permanent or intermittent stream
- e) temporarily ponded areas that are normally farmed
- f) dug-out ponds, or

- g) artificial bodies of water intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and sites and outdoor confinement areas.

Further, intermittent streams are defined as “a natural or artificial channel, other than a dam, that carries water intermittently and does not have established vegetation within the bed of the channel, except vegetation dominated by plant communities that require or prefer the continuous presence of water or continuously saturated soils for their survival” (O. Reg. 359/09).

Seepage areas are defined as “a site of emergence of groundwater where the water table is present at the ground surface, including a spring” (O. Reg. 359/09).

Subsection 3 of Section 31 of the REA Regulation requires the proponent to prepare a report setting out the following:

1. A summary of any corrections to the (Water Body Records Review) report prepared under Subsection 30(2) and the determinations made as a result of conducting the site investigations under Subsection (1).
2. Information relating to each water body identified in the records review and in the site investigations, including the type of water body, plant and animal composition and the ecosystem of the land and water investigated.
3. A map showing
  - i. the boundaries mentioned in clause (1) (c)
  - ii. the location and type of each water body identified in relation to the Project location, and
  - iii. the distance mentioned in clause (1) (d).
4. The dates and times of the beginning and completion of the site investigation.
5. The duration of the site investigation.
6. The weather conditions during the site investigation.
7. A summary of methods used to make observations for the purposes of the site investigation.
8. The name and qualifications of any person conducting the site investigation.
9. Field notes kept by the person conducting the site investigation.

This Water Body Site Investigation Report has been prepared to meet these requirements.

## **2. Summary of Water Body Records Review Results**

Table 2.1 summarizes the results of the Water Body Records Review (Hatch Ltd., 2011).

**Table 2.1 Summary of Records Review Determinations**

<b>Determination to be Made</b>	<b>Yes/No</b>	<b>Description</b>
Is the Project in a water body?	No	The Project will not be situated within a water body.
Is the Project within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity?	No	No lakes are present within 120 m of the Project location.
Is the Project within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity?	No	No lake trout lakes at or above development capacity are present within 300 m of the Project location.
Is the Project within 120 m of the average annual high water mark of a permanent or intermittent stream?	Yes	There is one watercourse within 120 m of the Project location.
Is the Project within 120 m of a seepage area?	No	No seepage areas are present within the Project area.

Therefore, the Water Body Records Review (Hatch Ltd., 2010a) indicated that, depending on the layout of the proposed Project, some components could potentially be located within 120 m of the average annual high water mark of a permanent or intermittent watercourse.

### 3. Site Investigation Methodology

#### 3.1 Site Investigation 1

##### 3.1.1 *Date, Time and Duration of Site Investigation 1*

- Date: June 22, 2010
- Start Time: 08:30 hours
- Duration: 11 hours

##### 3.1.2 *Weather Conditions During Site Investigation 1*

- Temperature: 22°C
- Beaufort Wind: 1
- Cloud Cover: 50%

#### 3.2 Site Investigation 2

##### 3.2.1 *Date, Time and Duration of Site Investigation 2*

- Date: June 2, 2011
- Start Time: 15:30 hours
- End Time: 17:30 hours

Duration: 2 hours



### 3.2.2 *Weather Conditions During Site Investigation 2*

- Temperature: 19°C

Beaufort Wind: 4

### 3.3 **Name and Qualifications of Person Conducting Site Investigation**

Both investigations were completed by Martine Esraelian. Paul Ashley was involved in the site investigation completed on June 2, 2011.

Martine Esraelian, B.Sc. is an Environmental Scientist specializing in species at risk and terrestrial ecosystems. She has a B.Sc. from Trent University where she specialized in Conservation Biology and Ecological Management and an Ecosystem Management Technician diploma from Sir Sandford Fleming College. During her time at Trent University, she completed a 1-yr internship with the Ministry of Natural Resources (MNR) which involved developing a genetic-based protocol for the extraction of DNA from unknown turtle eggshells to assist with species identification. The project entailed extensive molecular genetics research and intensive lab work to develop a protocol able to supplement existing conservation management practices.

She offers expertise across the full breadth of the field from environmental assessments and technical analysis of environmental data to conservation management, corporate and government consulting, and community outreach. Martine has liaised with all levels of government, the community, and a portfolio of clients that includes consulting firms, planners, and high-profile developers. She has both technical and hands-on experience conducting site investigations (terrestrial and aquatic), evaluations of significance, environmental and agricultural impact studies, constraint analyses, water quality and soil assessments, species at risk, wildlife management and fisheries studies to meet regulatory requirements.

Martine has a wide range of field experience related to terrestrial and aquatic ecosystems and species at risk. She has conducted reptile and amphibian surveys, small-mammal trapping, benthic invertebrate monitoring and fisheries inventories (seine netting and electrofishing). She has conducted detailed natural areas inventories which involve species identification of flora and fauna, vegetation community mapping, identifying rare vegetation communities and significant wildlife habitats.

Martine has project management and fieldwork experience for a number of species at risk monitoring projects. Some of the species she has been involved with include: fowler's toad, massasauga rattlesnake, gray ratsnake, Jefferson salamander, northern dusky and mountain alleghany dusky salamander, blanding's turtle, map turtle, spotted turtle, snapping turtle, queen snake, milksnake, ribbonsnake, flowering dogwood, swamp rose mallow and spoon-leaved moss.

Martine is a certified Butternut Health Assessor (BHA) and also holds a certificate in the Ecological Land Classification (ELC) system.

Paul Ashley, MSc., is a senior ecologist with Hatch Ltd. Paul has wide-ranging experience working in terrestrial and wetland landscapes. He has led many management and rehabilitation projects related to forests, savannahs, wetlands and riparian corridors. While doing so he has worked with representatives from all tiers of government, non government organizations, universities and the



private sector. Paul joined Hatch Ltd in 2010 and is actively involved in the Renewable Energy Approval process.

### **3.4 Survey Methods**

The entire site was searched by the observers on foot in order to document waterbodies. Photographs of the site and water body features were taken. Any observations of waterbodies, including the type of water body, instream habitat types, surrounding riparian areas, average annual high water mark and wildlife use were noted. Geographic coordinates at representative areas of the average annual high water mark were recorded using a submeter accuracy global positioning system (GPS) for mapping purposes.

A copy of the field notes kept by the observer is provided in Appendix A.

## **4. Results of Site Investigation**

This section documents the results of the Site Investigation and discusses specific water features observed on or within 120 m of the Project location. Features noted in the following sections, including the Project location boundary and the average annual high water mark and 30-m setback areas associated with watercourses are shown in Figure 4.1.

### **4.1 Permanent or Intermittent Streams**

The Water Body Records Review (Hatch Ltd., 2011) noted the presence of one unnamed tributary of the Raisin River approximately 50 m from the southeastern Project location boundary. A watercourse (named Watercourse A for the purposes of this Report) not noted during the Records Review was identified adjacent to the southern boundary of the southeastern corner of the Project location. These features are discussed in the following sections.

#### **4.1.1 Tributary of Raisin River**

As indicated in the Water Body Records Review (Hatch Ltd., 2011), an unnamed tributary of the Raisin River originates approximately 50 m west of the southeastern corner of the Project location (Figure 4.1) and flows south through the adjacent agricultural fields. The Raisin River Watershed Report Card (RRCA, 2010) indicated that there is habitat for Aquatic Species of Special Concern, including Bridle Shiner (*Notropis bifrenatus*) and River Redhorse (*Notropis bifrenatus*) within downstream sections of the tributary of the Raisin River, although these species are not known to be present within 120 m of the Project location.

This tributary was not able to be assessed during the site investigation, since it is located wholly on the adjacent property and the site investigator did not have permission to access that property. Based on observations made from the property boundary, this watercourse appears to be restricted to a narrow vegetated corridor surrounded by agricultural fields.

The average annual high water mark was assumed to be the edge of the natural vegetation adjacent to the watercourse. Figure 4.1 shows this high water mark and associated 30-m setback and the proposed Project location. The proposed Project will be located approximately 50 m from the high water mark of the tributary; therefore, an EIS will be required to assess potential adverse effects and mitigation measures.

#### **4.1.2 Watercourse A**

Watercourse A was not identified within the Water Body Records Review (Hatch Ltd., 2011). It is classified as an intermittent constructed drain as no standing water was observed during the June 2011 site investigation. This watercourse flows south through a wooded area south of the Project location and also occurs directly adjacent to a wetland.

The average annual high water mark was assumed to be the edge of the natural vegetation adjacent to the watercourse. Figure 4.1 shows this high water mark and associated 30-m setback and the proposed Project development footprint. The proposed Project will be located approximately 30 m from the average annual high water mark of the tributary; therefore, an EIS will be required to assess potential adverse effects and mitigation measures.

## **5. Conclusions**

Based on the results of the site investigation discussed above, a correction to the Water Body Records Review (Hatch Ltd., 2010a) is required as Watercourse A was not identified in the Report.

Based on the results of the site investigation and the proposed Project footprint shown in Figure 4.1, some components of the facility will be located between 30 and 120 m of the tributary of the Raisin River and Watercourse A. Therefore, an EIS will be required.

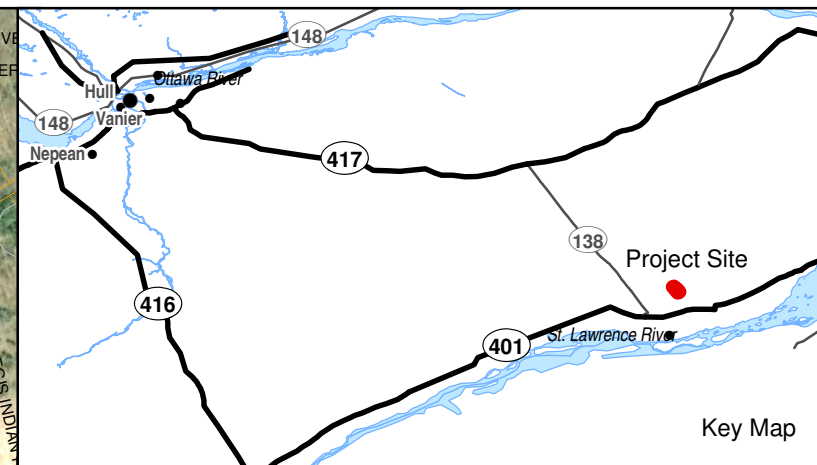
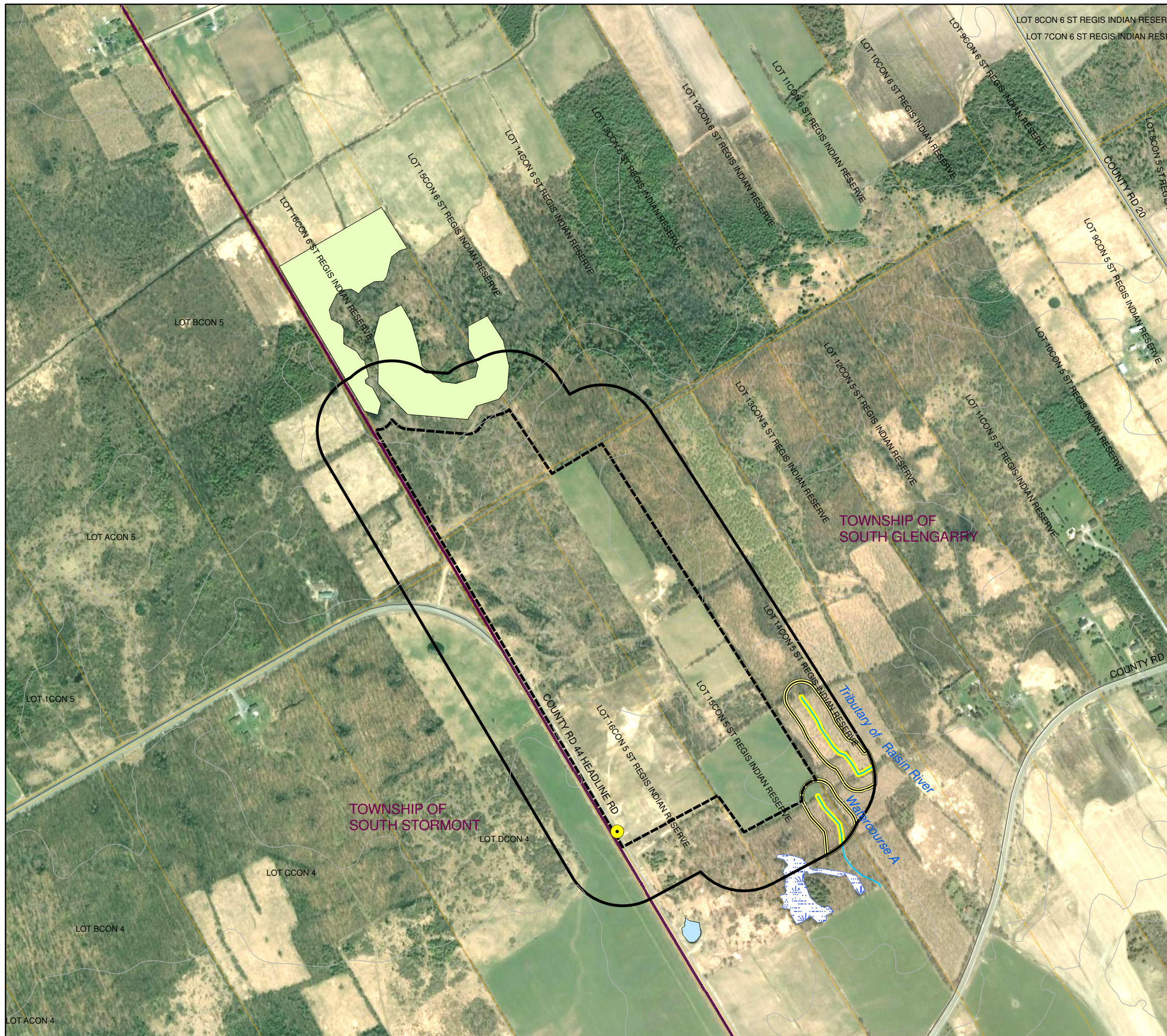
## **6. References**

Hatch Ltd. 2011. Glendale Solar Project – Water Body Records Review Report. Prepared for Northland Power Inc.

Raisin Region Conservation Authority (RRCA). 2010. Letter from L. Forrester (Watershed Planner & Regulations Officer, RRCA) to C. Coughlin (Aquatic Biologist, Hatch Ltd.). June 13, 2010.

RRCA. 2007. Watershed Report Cards. Available on-line at <http://www.rrca.on.ca/view.php?id=31> Accessed May 6, 2010.





- Legend**
- Watercourse
  - Road
  - Topographic Contour (5m Interval)
  - Average Annual High Water Mark
  - 30 m Setback From High Water Mark
  - Parcel
  - Municipal Boundary
  - Waterbody
  - Unevaluated Wetland
  - Evaluated Non-Provincially Significant Wetland
- 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. Spatial referencing UTM NAD 83, August 2010.  
 3. Satellite imagery from Google Earth Pro.

Figure 4.1  
 Northland Power Inc.  
**Glendale Solar Project**  
**Project Location and**  
**Water Body Features**



**Appendix A**  
**Site Investigation**  
**Field Notes**

Date: June 21, 2010

Time: 1930 - 2000

% C.C. = 30%

Beaufort Wind Scale: 1

Temp: 18°C

Bobolink

American Robin

Red-tailed hawk (pair)

low Area in bog field

- large boulders rocks & stones, cobbles exposed at surface

- low lying area with some tree sapling wet meadow vegetation, sedges, grasses.

- small rodent covered

red clover

white clover

corn rutch

bird's foot trefoil

black medick

common saw whetle

meadow horse tail

grasses

- Canada bluejoint

ox eye daisy

Date: June 22, 2010

Time: 0830 - 1930 (11.0 hrs)

% C.C. = 50%

Beaufort Wind Scale: 1

Temp: 22°C

deer tracks

deer carcass (leg only)

East Woodland

blue  
 butterfly

Small-fruited bulrush  
 Soft-stemmed bulrush  
 wild parsnip  
 Fragrant bedstraw  
 owl-fruited redce  
 wire sedge  
 Fox sedge  
 spike rush  
 downy thistle  
 goldenrod sp.  
 willow sp.  
 green sedge  
 trembling aspen saplings  
 narrow-leaved meadow-rue  
 cat-tail

edge - common watercress  
 ox-eye daisy  
 prickly-illy (A)  
 raspberry sp  
 strawberry (small to 2")

Red or green ash  
 black ash ?  
 Tur oak  
 Virginia creeper  
 Goldenrod sp (A)  
 rose sp  
 Rock elm  
 Summer maple  
 ironwood  
 hawthorn (D) shrub  
 white elm - drac  
 geranium  
 common althea  
 prickly gooseberry  
 buttercup  
 fragrant bedstraw  
 black red-top  
 sedges

moist soil

common buckeye  
 basswood  
 Staghorn sumac (O)  
 milkweed  
 purple flowering raspberry  
 dogwood sp  
  
 Butternut 18 0522422  
 4993982  
  
 Sugar maple  
 Black ash



open area

- same meadow sp as everywhere else  
 - common milkweed  
 - rocky soil

Eastern most boundary

Rock elm

Bittersweet

Red or Green ash

Pur. Oak

Black ash (O)

~~Black ash~~ ? American alder (hedgerow)

Rock elm

Oak ash

Butternut in hedgerow ~F?



Rock elm  
Red maple  
dogwood  
Common Apple

Canada Violet  
Foxglove stalk  
round lobed hepatica

Forest

Large Rock outcrop

Butternut (O)

Tramling Aspen

American Beech

Sugar Maple

Red Maple

Ironwood

Shagbark hickory

Butternut hickory

Red/Green Ash

Boxwood

cohorn (A)

baneberry

bloodroot

Scrub Area

leopard fig  
corote fig

Basswood	riverbank grape
Sugar Maple	goldenrod sp (A)
Ash	grasses
Stephanandra	ox-eye daisy
Bursera	purple-flower, (sp)
White Birch	prickly gooseberry
Bursera white oak	russula creeper
Trembling Aspen (D)	brown-eye Susan
White Birch	prickly-ash (A)
common apple (A)	nettle
oak (bur) (A)	
elm	
shrubby cingulifera	

low-lying area

willow sp
sedges
narrow-leaved meadow grass
penstemon sp
red aster, dogwood
small: fern - 3
buckhorn
Ash sp (green)
bedstraw
silver maple
swamp milkweed
roustema?
Sp. with
Fraxinus

Back wet area

Spruce (B)  
Black ash (A)

grasses (blue - found)

Spotted Joe.

willow

red-osier

yellow ramose