

PENN ENERGY – BRANTGATE

153 BISHOPSGATE ROAD, PART LOTS 1-2, CONCESSION 11

COUNTY OF BRANT, ONTARIO

SOLAR ENERGY FACILITY

Fit Contract No. F-001576-SPV-130-505
FIT Application No. FIT-FCELIHJ
COD: February 25, 2014

WATER ASSESSMENT REPORT

RECORDS REVIEW AND SITE INVESTIGATION

Report Prepared For:

Penn Energy Renewables, Ltd.
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7067



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1.0 Introduction

1.1 Project Description

Penn Energy Renewables, Ltd. (Penn) has executed a FIT contract with the Ontario Power Authority (OPA) for the construction of an 8 MW, ground-mounted, Class 3 solar energy facility approximately 14 kilometres southwest of the City of Brantford, in the County of Brant, Ontario. The Subject Lands are located in part of Lots 1 and 2 Concession 11, in the County of Brant, geographic rural community of Burford. The site is located between the communities of Bishopsgate and Scotland. The Subject Lands occupy 35.6 ha, located on the west side of Bishopsgate Road and north of Concession Road 12 (**Appendix A, Figure 1**).

The “Project Location” is a subset of the Subject Lands, occupying 19.2 ha. The proposed Renewable Energy Generation Facility (REGF) would consist of a collection of solar photovoltaic (PV) modules (each approximately 1.00 m x 1.67 m or 1.00 m x 2.00 m in dimension) that are grouped into arrays tilted and facing south. These stationary arrays are strung together forming a series of rows oriented east to west. The Environmental Protection Act (EPA) administered by the Ministry of the Environment (MOE) regulates Renewable Energy Approvals (REAs) under Part V.0.1 of the act, pursuant to Ontario Regulation 359/09 (O.Reg. 359/09). Savanta Inc. (Savanta) has been retained by Penn to conduct a Water Assessment and Waterbody Report in support of the application.

1.2 Renewable Energy Approval Legislative Requirements

Ontario Regulation 359/09 (O. Reg. 359/09), hereafter referred to as the REA Regulation, was enacted on September 24, 2009 and lists various Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. As part of the environmental analysis required for renewable energy projects, a Water Assessment and Water Body Report is to be prepared as part of an application under O. Reg. 359/09.

1.3 Purpose of Water Body Report

O. Reg. 359/09 includes specific requirements for projects that are proposed to be located:

- Within a lake, permanent stream, intermittent stream or seepage area; or,
- Within the setback area of the average annual high water mark of a lake, kettle lake, Lake Trout lake, permanent or intermittent stream, or a seepage area.

These specific requirements of the REA Regulation requires proponents to undertake a Water Body Records Review to screen the Project Location and determine if the project is:

- In a water body;
- Within 120 metres of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity;
- Within 300 metres of the average annual high water mark of a lake trout lake that is at or above development capacity;
- Within 120 metres of the average annual high water mark of a permanent or intermittent stream; or,

- Within 120 metres of a seepage area.

The study must also include site investigations to determine if any unmapped or unrecorded water features exist within the study area of the project. Under O. Reg 359/09, a water body is defined to include a lake (including kettle lakes and Lake Trout lakes), a permanent stream, an intermittent stream and a seepage area, but does not include the following:

- Grassed waterways;
- Temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through;
- Rock chutes and spillways;
- Roadside ditches that do not contain a permanent or intermittent stream;
- Temporarily ponded areas that are normally farmed;
- Dugout ponds; or,
- 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.

Water bodies identified in the Records Review must be investigated to confirm the presence, location and boundary of the feature. The REA Regulation requires that a physical investigation of the land and water located within 120 metres of the project location be conducted for the purpose of determining:

- Whether the results of the Records Review are correct or require correction, and to identify any required corrections;
- Whether any additional water bodies exist, other than those identified in the Records Review;
- The boundaries, located within 120 metres of the Project Location, of any water body that was identified in the Records Review or the Site Investigation; and,
- The distance from the Project Location to the boundaries of any water body that was identified in the Records Review.

This report is intended to document the results of the Records Review and Site Investigations for the Project Location and surrounding area.

2.0 Methodology and Results

As part of the Records Review, various agency websites were consulted for mapping data and information pertaining to potential water bodies (watercourses and lakes) within the Project Location and within 1 km of the Project Location. In addition, consultation was carried out with various agencies during the preparation of the Natural Heritage Assessment (NHA) Records Review, produced under separate cover. The consultation with the agencies at that time provided an opportunity for identification of natural features within the surrounding area, including water bodies.

Records for areas within a minimum distance of 1 kilometre from the Project Location were searched to determine any natural features, including water body features, within this radius, as well as to document any mapped waterbody features within the Project Location. During the NHA Records Review, the following records were searched:

- Ministry of Natural Resources (MNR) Natural Heritage Information Centre Database (NHIC) (April 2012);
- Guelph MNR District Natural Resources & Values Information System Database (September 2011);
- MNR's Land Information Ontario Database (LIO) (April 2012);
- Ontario Breeding Bird Atlas (OBBA) (2005);
- Ontario herpetofaunal summary atlas (April 2012);
- MNR Guelph District Office (September 2011);
- Grand River Conservation Authority (GRCA) (September 2010);
- Long Point Region Conservation Authority (LPRCA) (2010); and,
- County of Brant Official Plan and Schedules (2010).

In addition to the screening of the above during the NHA, the following records were searched online for this Water Body Report:

- Ministry of Natural Resources (Land Information Ontario database);
- Ontario Ministry of Agriculture Food and Rural Affairs (municipal drainage);
- Federal Government (including Fisheries and Oceans Canada);
- Grand River Conservation Authority (Grand River Information Network (GRIN)); and,
- County of Brant.

The results of the Records Review are discussed in Section 2.1 below.

2.1 Ministry of Natural Resources Records

2.1.1 Methodology

On August 18, 2011 a pre-consultation meeting for the NHA was held at MNR Guelph District Office. At that time a request for relevant natural feature records housed within MNR Guelph District's office was made. On September 12, 2011 MNR provided a letter of their review of relevant records housed at the District's office. MNR's record review did not delineate any water body features within the Project Area or within the 120 m adjacent lands. In September 2011 various data layers from LIO, Ministry of Northern Development and Mines and Forestry and NRVIS Guelph MNR District were queried. The Fairfield Plain Wetland, which contains a portion of open water marsh, has been confirmed to lie 140 m away from the outer boundary of the Project Area.

In addition to the other provincial screening tools (e.g. NHIC) utilized, the following MNR on-line records were reviewed:

- Ontario Base Maps (OBM) and natural feature layers from Land Information Ontario (LIO) (<http://www.mnr.gov.on.ca/en/Business/LIO/index.html>).
- The Geographic Network of Canada (GNC) (<http://www.geographynetwork.ca>) was also accessed to determine if any additional OBM mapping support was available.

2.1.2 Results

The OBM mapping (cross referenced with other sources) identified the following water bodies within the approximate 1 kilometre radius from the Project Location:

- Upper Mackenzie Creek is located east of the Project Location, approximately 1098 metres from Bishopsgate Road, and is within the Mackenzie Creek basin. It lies within the Oakland Swamp. The creek flows from north to south to Oakland where it enters the Oakland Pond. From there, it flows easterly to Oshweken, where it swings southerly and eventually joins the Boston Creek and finally the Grand River at York. The Grand River discharges to Lake Erie at Port Maitland.
- An unnamed tributary to Upper Mackenzie Creek is approximately 380 metres due east of the Project Location.
- An unnamed tributary to Upper Mackenzie Creek appearing to discharge from a wetland pond is located approximately 850 metres to northeast.
- Two ponds that appear to be isolated are located 425 metres due east of the Project Location.
- A pond (apparently isolated) lies to the north of these two ponds and is approximately 490 metres away from the Project Location.
- The open water marsh associated with the Fairfield Plain Wetland is 140 m from the southwest corner of the Project Location.
- An isolated wetland pond lies to the northeast near Maple Avenue South, approximately 900 metres away from the Project Location.

None of the waterbody features identified on OBM mapping are located on or within 120 metres of the Project Location. The GNC website did not provide any additional mapping information.

2.2 Ontario Ministry of Agriculture, Food and Rural Affairs Records

2.2.1 Methodology

The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) website was reviewed:

Rural Drainage Mapping (http://www.lio.ontario.ca/imf-ows/imf.jsp?site=ads_en)

2.2.2 Results

OMAFRA mapping identified the same water body features within 1 kilometre of the Project Location as shown on the OBM mapping. None of these water bodies are on or within 120 metres of the Project Location.

The OMAFRA mapping identified agricultural tile drainage within the 1 kilometre radius. Random tile drainage is located approximately 305 metres to the northwest of the Project Location. Systematic tile drainage is located in two locations to the east; 265 metres away, near the north isolated pond, and 450 metres away, associated with the unnamed tributary south of Maple Grove Road. No constructed drains are identified within 1 kilometre of the Project Location.

2.3 Federal Government Records

2.3.1 Methodology

The following Federal government websites were reviewed to determine if any records regarding water bodies on or adjacent to the Project Location were available:

- Natural Resource Canada (NRCAN) National Topographic System (NTS) topographic maps (<http://atlas.nrcan.gc.ca/site/english/maps/topo/map>)
- DFO Aquatic Species at Risk Distribution Mapping available from Conservation Ontario website (zip file download available for Grand River Conservation Authority and Long Point Region Conservation Authority at site) (<http://conservation-ontario.on.ca/projects/DFO.html>)
- Fisheries and Oceans Canada (DFO) website (<http://dfo-mpo.gc.ca/regions/central/habitat/os-eo/index-eng.htm>)

2.3.2 Results

The NRCAN topographic mapping and DFO Aquatic Species at Risk Distribution mapping show the exact same water bodies within 1 kilometre of the Project Location as the OBM and OMAFRA mapping. No water bodies are located on or within 120 metres of the Project Location.

Department of Fisheries and Oceans (DFO) Aquatic Species at Risk mapping does not identify any species at risk in water bodies within the 1 kilometre radius. Both GRCA and LPRCA distribution maps were examined. The DFO website does not provide any mapping or information related to specific water bodies.

2.4 Conservation Authority Records

2.4.1 Methodology

The southeastern corner of the Project Location is within the Grand River Watershed. On September 1, 2010 Andrew Herreman, Resource Planning Technician with GRCA was contacted by phone and email to provide any natural features information for the Records Review. On the same day Andrew provided an email response that there are no natural features of interest to the GRCA within the Records Review area.

The majority of the Project Location is within the Big Creek above Kelvin subwatershed within the Lake Erie watershed and managed by the LPRCA. Between September 8 and 15, 2010 phone and email discussions were held with Jeff Shaughnessy, Planning Assistant and Bonnie Bravner, Resources Technician with LPRCA. On September 15, 2010 LPRCA provided an assessment letter and map noting that within the Subject Lands (Project Location is a subset) are within the eastern edge of the Fairfield Plain Wetland (non-PSW), and LPRCA regulation area.

The GRCA GRIN website is a highly interactive mapping tool and allows users to construct specific maps to their study area and add various GIS layers to determine if natural features are present. This mapping system mimics the one used by GRCA staff when responding to queries regarding properties.

(<http://www.grandriver.ca/index/document.cfm?Sec=63&Sub1=0&sub2=0>).

2.4.2 Results

The mapping from the GRCA site identified the same water bodies as shown on the previous searches (including those within the LPRCA jurisdiction). A further layer identified that Upper Mackenzie Creek is considered a coldwater stream. No water bodies are located on or within 120 metres of the Project Location.

No mapping was available on the LPRCA website, however the GRCA mapping does overlap the watershed boundary. Based on correspondence from LPRCA staff, no water bodies were identified on or within 120 metres of the Project Location.

2.5 *Municipal Records*

2.5.1 Methodology

The April 20, 2004 Official Plan is currently in place, however the Draft September 2010 Official Plan was been approved by council and has gone to the Ministry of Municipal Affairs and Housing for review. As part of the Records Review, the current Official Plan of 2004 and its relevant schedules were reviewed.

The Brant County website was also reviewed (<http://www.brant.ca>). No interactive mapping specific to the Project Location is available on the website. However, GRCA developed their GIS system and aerial photographic catalogue through partnerships with their member municipalities, and therefore the GRCA mapping would be representative of municipal records.

2.5.2 Results

Under Section 3.3.3, Policies, the Brant County Official Plan identifies various policies applying to those lands designated “Natural Environment” on Schedules A and B. Among these are coldwater streams. Item (7) under Section 3.3.3. indicates that, where coldwater streams occur outside of other Natural Environment features, the watercourse and land generally 30 m on either side of the watercourse will be subject to the policies of the Natural Environment designation. Upper Mackenzie Creek, which is located 1098 metres to the east of the Project Location, is identified as a coldwater stream. It is well beyond the 120 m from the Project Location, and the policies of the OP will be respected.

3.0 Site Investigation

Site investigations were carried out on July 2 and 9, 2010, and on September 9, 2011 in the Project Area and Adjacent Lands (120 m) to field truth all environmental features documented through the Records Review. In addition, the area was surveyed on May 21 and June 17, 2011 for wildlife documentation, however incidental site observations beyond the scope of wildlife

were also recorded. See Table 3.1 for timing of field surveys and weather conditions during the site investigations.

Table 1. Timing and Weather Conditions During Site Investigations

Date(s) (m/d/yr)	Time(s) & Duration	Weather Conditions
07/02/2010	0900 to 1400	21-22C, sunny, wind <10 km/h
09/09/2011	0900 to 1500	21-22C, sunny, wind <10 km/h
07/09/2010	1030 to 1230	21-22 C, light overcast, occasional mist/light rain, no wind
05/21/2011	1800 to 2030	Clear, 25 C, calm
06/17/2011	1045 to 1145	24C, southwest at 10 km/h; 50% cloud cover

Field surveys were carried out by Dr. Christopher Zoladeski and Mr. Doug McRae. Dr. Zoladeski is a botanist and senior ecologist with over 18 years experience in environmental consulting. Mr. McRae is an ornithologist and wildlife biologist and has over 30 years experience with the ecology of boreal, temperate, neo-tropical and tropical ecosystems.

It was confirmed through all site investigations that no water bodies (watercourses, etc.) are located within the Project Location or within 120 m. In addition, no groundwater seepage areas were observed on or within 120 m of the Project Location. The Fairfield Plain Wetland was confirmed to be 140 m from the Project Location.

4.0 Summary of Results and Next Steps

Table 2 below summarizes the results of the Records Review in regards to the criteria presented in Ontario Regulation 359/09, and in the context of the various water bodies that were identified within a 1 kilometre radius of the Project Location, as listed in Section 2.

Table 2. Summary of Records Review: Brantgate Solar Energy Facility

Reg. 359/09 Criterion	Yes/No	Description
Is the Project Location in a water body?	No	No water bodies were identified on or within 120 m of the Project Location.
Is the Project Location within 120 m of the average annual high water mark of a lake, other than a Lake Trout lake?	No	No lakes were identified on or within 120 m of the Project Location.
Is the Project Location within 300 m of the average annual high water mark of a Lake Trout lake?	No	No Lake Trout lakes are identified on or within the vicinity of the Project Location.
Is the Project Location within 120 m of the annual average high water mark of a permanent or intermittent stream?	No	No permanent or intermittent streams were identified within 120 m of the Project Location.

Reg. 359/09 Criterion	Yes/No	Description
Is the Project Location within 120 m of a seepage area?	No	No seepage areas were identified on or within 120 m of the Project Location.

In addition to the Records Review, it was verified through Site Investigation that there are no water bodies present on, or within 120 metres of the Project Location. In addition, no seepage areas were observed on or within 120 metres of the Project Location.

Report Prepared by:



Sean Geddes
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Savanta Inc.

5.0 References and Background Materials

Brant County website (<http://www.brant.ca/>).

COSEWIC. 2011. Species at Risk Registry. Available online (<http://www.sararegistry.gc.ca>)

Fisheries and Oceans DFO Aquatic Species at Risk Distribution Mapping
(<http://conservation-ontario.on.ca/projects/DFO.html>)

Fisheries and Oceans Canada (DFO) website ([http://dfo-mpo.gc.ca/regions/central/habitat/os-
eo/index-eng.htm](http://dfo-mpo.gc.ca/regions/central/habitat/os-
eo/index-eng.htm))

Geographic Network of Canada (GNC) (<http://www.geographynetwork.ca>)

Grand River Information System

(<http://www.grandriver.ca/index/document.cfm?Sec=63&Sub1=0&sub2=0>).

Ministry of Natural Resources Ontario Base Maps (OBM) and natural feature layers from
Land Information Ontario (LIO) (<http://www.mnr.gov.on.ca/en/Business/LIO/index.html>).

Natural Heritage Information Centre (NHIC). 2012. Provincial status of plants, wildlife and
vegetation communities databases. Ontario Ministry of Natural Resources, Peterborough.
Available online (<http://www.mnr.gov.on.ca/MNR/nhic/nhic.html>)

Natural Resource Canada (NRCAN) National Topographic System (NTS)
(<http://atlas.nrcan.gc.ca/site/english/maps/topo/map>)

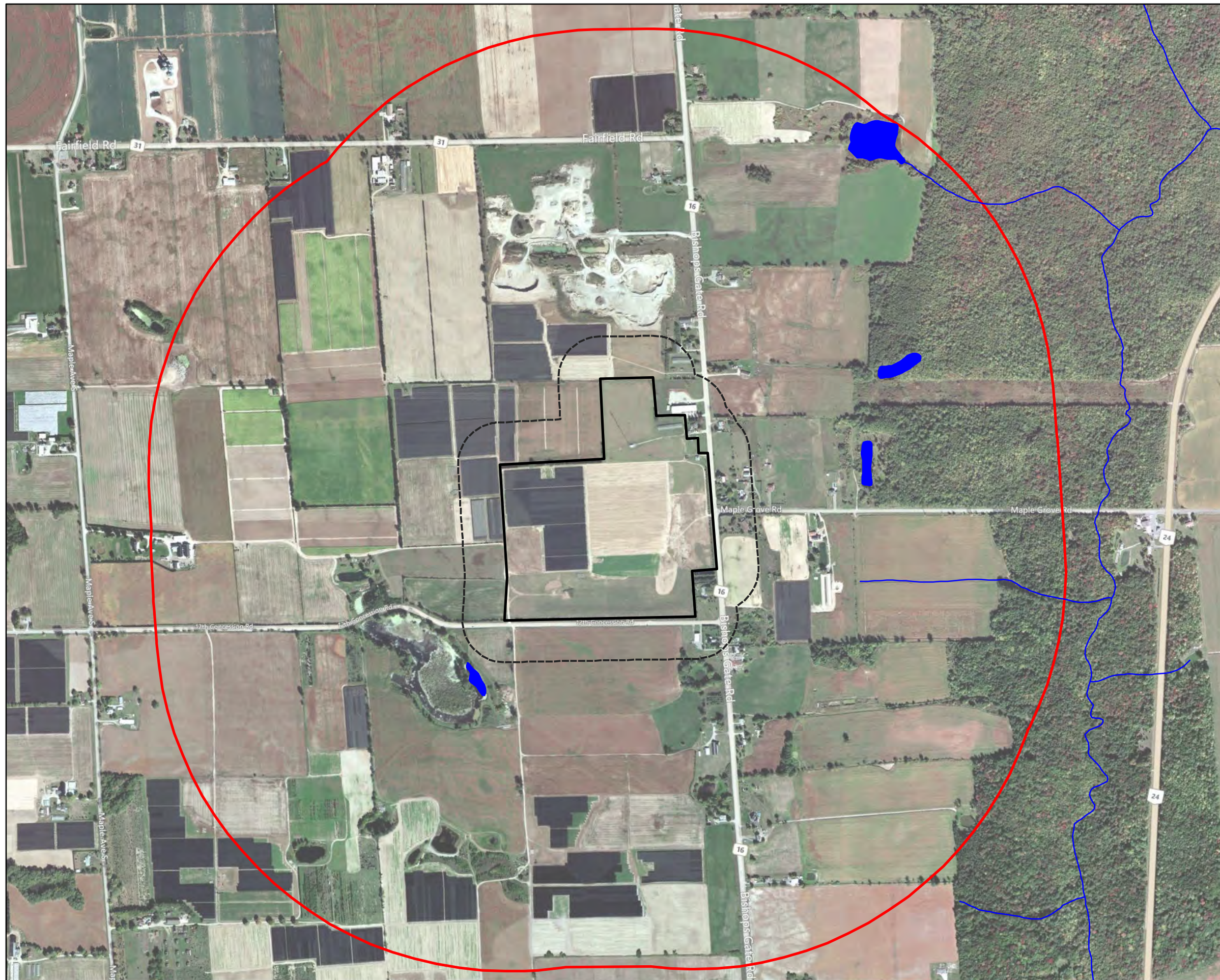
OMAFRA Rural Drainage Mapping

(http://www.lio.ontario.ca/imf-ows/imf.jsp?site=ads_en)

Appendix A

Figures

Figure 1. Location of Subject Lands and Water Bodies within 1 kilometre



- Map Legend**
- Project Location
 - Study Area and Adjacent Lands (120m from Project Location)
 - 1km Buffer of Project Location
 - Watercourse within 1 km
 - 1km Radius from Project Location

Source: Aerial Orthophoto: Bing Maps 2007.
Water: MNR Land Information Ontario.

Water Assessment Report - Records Review and Site Investigation

Penn Energy Renewables, Ltd.
153 Bishopsgate Road, County of Brant, Ontario

Figure 1
Water Bodies within 1 kilometre of Project Location



Appendix B

Field Memos



MEMORANDUM

To: Heather Whitehouse

From: Chris Zoladeski

CC

File: 7067

Date: October 7, 2011

Re: Penn Energy - Brantgate, 153 Bishopsgate Road, County of Brant, ON Vegetation and Botanical Survey Results

The site was surveyed on July 2, 2010, and 9 September, 2011. The 2011 visit included areas within the 120 m setback from the Subject Lands. Following a satellite image interpretation, a preliminary mapping of potential vegetation types was created. During field investigations, these areas were identified, sampled and revised, using the sampling protocol of the Ecosystem Land Classification (ELC) for Southern Ontario (Lee et al. 1998). Species names generally follow the nomenclature of Flora Ontario (University of Guelph, FOIBIS website).

Vegetation

The subject lands are practically entirely under agricultural use, with alternating plantations of ginseng and various types of crop and an actively managed hayfield. Figure 3 shows the features of the lands and the setback.

There are no natural vegetation areas present on the property. To the west of Bishopsgate Road, a wet disturbed area is present, with mild water-pepper and water-cress, in addition to common weeds, such as common plantain, Canada blue grass and narrow-leaved hawk's beard. A few shrubs of peach-leaved willow are scattered.

In the south-western corner of the lands a small area of Cultural Old Field Meadow is found, while on the south side of the road Duckweed Floating-leaved Shallow Aquatic type occurs within the open pond area.

Several treed hedgerows line the roads and edges of fields. They are mostly composed of young white cedar trees or saplings, with Scots pine, and white and silver spruce refining the several residences.

In the south-east corner, portions of Cultural Old Field Meadow and Lilac Cultural Thicket occur within the setback zone.

Scattered about the site and the setback are several single trees, mostly cottonwoods.

Flora

Ninety-four species of vascular plants were recorded from the Subject Lands. Of that number, only 35 (or 37%) species are native, and 59 (or 63%) are exotic. This very high

proportion of the introduced species reflects the agricultural character of the lands and lack of natural habitats.

All of the native species are ranked S5 (Secure – common, widespread and abundant in Ontario).

No rare, threatened or endangered species were recorded from the Subject Lands or vicinity.

Results of surrounding areas access visitations

During the September 2011 site visit, the majority of the outlying setback zone was clearly visible from the edges of the Subject Lands proper and from the main roads.

The following area's owners and/or tenants were asked for permission to enter their lands:

- 133 Bishopsgate (Frank Borghoff). Tenant present and granted permission.
- 163 Bishopsgate. Mr. Boulanger (renter) present and granted permission.
- 144 Bishopsgate (Mrs. Helen Matecsa). Owner absent, lands not accessed.

References

Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario. First Application and its Application. SCSS Field Guide FG-02. 225pp.

Varga, S., editor. August 2000. Distribution and status of the vascular plants of the Greater Toronto Area. Ontario Ministry of Natural Resources, Aurora District. 103



MEMORANDUM

To: Heather Whitehouse

From: Doug McRae

CC

File: 7067

Date: October 7, 2011

**Re: Penn Energy - Brantgate, 153 Bishopsgate Road, County of Brant, ON
Wildlife Survey Results**

The Subject Lands were visited over two years: 9 July 2010; 17 June and 5 July 2011 for bird and wildlife species. The property is mostly made up of open crop fields, covered crops, and a sparse "L" shaped actively managed hayfield area along the south and east boundary. The soil here is very fine and sandy. There are some cedar hedgerows but no other trees or forest to speak of. There is very little habitat variety, or protective cover for birds and wildlife. There is a large pond approximately 140 m southwest of the Project Location attracts a number of birds not typically associated with the Subject Lands, but that might be seen incidentally in passage (i.e.: Great Blue Heron).

A total of 29 species were observed on the Subject Lands during our breeding season field work and of these, only 14 were suspected of actually breeding on site. This very limited avifauna is not surprising given that the Subject Lands are under active agricultural use.

This low breeding diversity seems especially noticeable when compared to the 92 species recorded as either confirmed, possible or probable breeders from this 10x10 km Breeding Bird Atlas Square (2001-2005). Many of these 92 species are associated with habitats not found on the Subject Lands. These include forested and open wetlands (Pied-billed Grebe, Green Heron, Wood Duck, Hooded Merganser, Virginia Rail, Sora), mature forest (Ruffed Grouse, Pileated Woodpecker, White-breasted Nuthatch, Eastern Wood Pewee, Ovenbird) as well as areas of old field in succession and scrub (Brown Thrasher, Eastern Towhee, Field Sparrow).

Common mammals were observed (domestic dog, woodchuck and European Hare). No herptiles (amphibians, salamanders, snakes, turtles) were observed which is expected due to lack of habitat (hibernacula, breeding or foraging habitat).