Penn Energy- Van Dorp
SOLAR ENERGY FACILITY

in the Municipality of Port Hope
Northumberland County
FIT Application No. FIT-FLTV77L
FIT Contract No. F-001573- SPV-130-505

Waterbodies Assessment
Site Investigation
DRAFT

Prepared for: Penn Energy Renewables Ltd.
620 Righters Ferry Road, Bala Cynwyd, PA 19004

Submitted by: Niblett Environmental Associates Inc.
PN 10-066

October 2012

Niblett Environmental Associates Inc.
Biological Consultants

October 18, 2012 PN 10-066

Penn Energy Trust
620 Righters Ferry Road
Bala Cynwyd, PA 19004

Attention : Mr. Glen Tomkinson

RE: **Penn Energy- Van Dorp**
SOLAR ENERGY FACILITY
in the Municipality of Port Hope, Northumberland County
FIT Application No. FIT-FLTV77L
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Water Bodies Assessment
Site Investigation-DRAFT

Dear Mr. Tomkinson:

We are pleased to submit the Water Bodies Assessment Site Investigation Draft Report for the proposed Van Dorp solar energy facility as part of the Natural Heritage Assessment for this project.

The report follows the outline provided in the MNR Natural Heritage Assessment Manual.

If there are any comments or questions on the content please contact us.

Yours very truly,

Chris Ellingwood
President and Sr. Terrestrial and Wetland Biologist

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1.0 Introduction

Penn Energy Renewables Ltd. has obtained a Feed-In-Tariff (FIT) contract from the Ontario Power Authority for the construction of a 10 MW (AC) solar PV renewable energy generation facility near the town of Port Hope (Figure 1). The project area is located on part of Lots 23 and 24, Concession 2 in the geographic Township of Hope in Northumberland County, known municipally as 2300 Wesleyville Road. The facility consists of single photovoltaic (PV) modules that are approximately 3 ft. x 5 ft. in dimension. Modules are grouped in arrays (8-24 each) which are aligned in rows; these rows are separated by access aisles approximately 12 ft. in width. The project area will consist of 55, 000 PV modules and 10-15 modular collection houses. The Environmental Protection Act (EPA) administered by the Ministry of the Environment (MOE) regulates the issuance of a Renewable Energy Approval (REA). The requirements applicants must meet to receive an REA are outlined in the REA regulation (Ontario Regulation 359/09). The REA regulation requires that applicable renewable energy projects complete a Natural Heritage Assessment (NHA), which identifies natural features and provincial parks and conservation reserves near the proposed project location. Subsection 30 (1) of the REA regulation requires proponents of Class 3 solar projects to undertake a Water Body Records Review to identify "whether the project is

i) In a water body
ii) 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
iii) Within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity
iv) Within 120 m of the average annual high water mark of a permanent or intermittent stream, or
v) Within 120 m or a seepage area" (O. Reg. 359/09, s. 30. Table).

Subsection 30 (2) 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 Water Body Records Review Report has been prepared to meet these requirements.

This report will discuss the results of the records review in summary. In addition to discussing the methodology and results of the site investigation, meant to ground truth the results of the records review and determine whether there were any additional water bodies not identified within the records review within the project location or within 120m of it.

2.0 Records Review: Summary

2.1 Applicable Guidelines and Regulations

2.1.1 Renewable Energy Approval Guidelines

Records that were reviewed and assessed can be found in the following sections. The purpose of this section is to determine whether any water body features exist on or adjacent to the project location. The definition of a water body is stated in Section 1 (1) of the REA regulation:

"water body includes a lake, a permanent stream, an intermittent stream and 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 and 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) Dugout 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."

As amended by O. Reg 521/10, subsection 31 (1) of the REA regulation requires an investigation of the land and water within 120 m of the project location, either by physically visiting the site or by an alternative investigation of the site, in order to determine the following:

A) Whether the results of the analysis summarized in the Water Body Records Review Report (NEA, 2012) prepared under subsection 30 (2) are correct or require correction, and identifying any required corrections;
B) Whether any additional water bodies exist, other than those that were identified in the Water Body Records Review Report (NEA, 2012) 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 Water Body Records Review Report (NEA, 2012) or the site investigation; and
D) The distance from the project location to the boundaries determined under clause (c)

Subsection 31 (2) of the REA regulation outlines specific requirements for lake trout lakes present within 300m of the Project Location. These requirements were not applicable to this project as no lakes were identified within the Water Body Records Review (NEA, 2012).

As amended by O. Reg 521/10, subsection 31 (4) of the REA regulation requires the proponent to prepare a report setting out the following:

1) A summary of the determinations made as a result of conducting the site investigation, and any corrections required to the Water Body Records Review Report (NEA, 2012).
2) Information relating to each water body identified in the Water Body Records Review Report (NEA, 2012) and in the site investigation, including the type of water body, plant and animal composition and the ecosystem of the land and water investigated.
3) A map showing
    i) Boundaries mention in clause 31(1)
    ii) The location and type of each water body identified in relation to the project location, and
    iii) All distances mentioned in clause 31(1)
4) A summary of methods used to make observations for the purposes of the site investigation.
5) The name and qualifications of any person conducting the site investigation.
6) If an investigation was conducted by visiting the site:
    i) The dates and times of the beginning and completion of the site investigation
    ii) The duration of the site investigation
    iii) The weather conditions during the site investigation
    iv) Field notes kept by the person conducting the site investigation
7) If an alternative investigation of the site was conducted:
    i) The dates of the generation of the data used in the site investigation
    ii) An explanation of why the person who conducted the alternative investigation determined that it was not reasonable to conduct the site investigation by visiting the site.

A physical site visit was conducted on May 2, 2012. The alternative site investigation approach was therefore not used and clause 7 of subsection 31 (4) does not apply to this project.

2.1.2 Ganaraska Region Conservation Authority

Ontario Regulation 168/06-Development, interference with Wetlands and Alterations to Shorelines and Watercourses requires permits to be obtained from the GRCA in cases where development, alteration or construction is proposed in hazard lands, floodplains, watercourses or wetlands.

Except where permitted under O. Reg 168/06, development is prohibited:

a) Adjacent or close to the shoreline of the Great Lake-St Lawrence River System or to inland lakes that may be affected by flooding, erosion or dynamic beaches, including the

area from the furthest offshore extent of the Authority's boundary to the furthest landward extent of the aggregate of the following distances:

i) the 100 year flood level, plus the appropriate allowance for wave uprush as calculated by the equations provided in the document entitled "Shoreline Flood Elevation Study, Lake Simcoe, Lake Couchiching", April 1981, which is available at or through the Authority at its head office located at 120 Bayview Parkway, Newmarket, Ontario, L3Y 4X1,

ii) the predicted long term stable slope projected from the existing stable toe of the slope or from the predicted location of the toe of the slope as that location may have shifted as a result of shoreline erosion over a 100 year period, and

iii) where a dynamic beach is associated with the waterfront lands, an allowance in metres inland, determined by the authority, to accommodate dynamic beach movement.

b) River or stream valleys that have depressional features associated with a river or stream, whether or not they contain a watercourse, the limits of which are determined in accordance with the following rules:

i) Where the river or stream valley is apparent and has stable slopes, the valley extends from the stable top of bank, plus 15 meters, to a similar point on the opposite side,

ii) Where the river or stream valley is apparent and has unstable slopes, the valley extends from the predicted long term stable slope projected from the existing stable slope or, if the toe of the slope is unstable, from the predicted location of the toe of the slope as a result of stream erosion over a projected 100-year period, plus 15 meters, to a similar point on the opposite side,

iii) Where the river or stream valley is not apparent, the valley extends the greater of,

A) The distance from a point outside the edge of the maximum extend of the flood plain under the applicable flood event standard, plus 15 meters, to a similar point on the opposite side, and

B) The distance from the predicted meander belt of a watercourse, expanded as a required to convey the flood flows under the applicable flood event standard, plus 15 meters, to a similar point on the opposite side;

c) Hazardous lands;

d) Wetlands; or

e) Other areas where development could interfere with the hydrologic function of a wetland, including areas within 120 meters of all provincially significant wetlands, and areas within 30 meters of all other wetlands, but not including those where development has been approved pursuant to an application made under the Planning Act or other public planning or regulatory process.

In addition to the above Ganaraska Region Conservation Authority has a level III agreement with the Department of Fisheries and Oceans Canada (DFO). This signed agreement with Fisheries and Oceans Canada and Ganaraska Region Conservation Authority deals with the management and protection of fish habitat;there are three levels of agreement. Level III, the highest obtained, determined by Fisheries and Oceans Canada (2005) includes the following:

- *The local Conservation Authority conducts the initial review of the project to identify any impacts to fish and fish habitat. If there are potential impacts to fish and fish habitat, the project is forwarded to the local DFO office for further review.*
- *The Conservation Authority determines how the proponent can mitigate any potential impacts to fish and fish habitat. If impacts to fish and fish habitat can be mitigated, then the Conservation Authority issues a letter of advice. If impacts to fish and fish habitat cannot be fully mitigated, the project is forwarded to the local DFO office for further review.*
- *The Conservation Authority works with the proponent and DFO to prepare a fish habitat compensation plan. The project is then forwarded to the local DFO office for authorization under the Fisheries Act.*

2.2 Summary of Results

Table 1 below outlines the findings based on the Records Review (NEA, 2012)

Table 1. Records Review Summary of water body features within 1km of the project location.

Required determinations for water body features in proximity to the project location		
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 that is at or above development capacity?	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 that is at or above development capacity?	No	No lake trout lakes were identified within 300 m of the project location
Is the project location within 120 m of the average annual high water mark of a permanent or intermittent stream?	Yes	Two tributaries were located within a 120 m radius of the project location
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

As a result of the Records Review (NEA, 2012) it was found that the project location was found within 120 m from two water body features. A site investigation is required in order to field verify the findings from the Records Review. In addition, the site visit will also determine whether there are other water body features within the 120 m of the project location that were not identified in the Records Review.

3.0 Site Investigation: Details and Methodology

3.1 Background

A site investigation was conducted on May 2, 2012. The purpose for the site investigation was to

- Verify the information determined in the Water Body Records Review (NEA, 2012)
- Document existing conditions, including: the types of water bodies present on and around the project location, plant and animal composition and the ecosystem of the land and water
- Outline the determinations made as a result of conducting the site investigation, and identify any necessary corrections required for the Water Body Records Review (NEA, 2012).

One site investigation was conducted on the project location and the adjacent area to ground truth the water body features found in the Records Review. The site investigation was carried out in accordance with Section 31 of the REA regulation.

Table 2. Field Investigation Details

Date:	May 2, 2012
Start Time:	1pm
Completion Time:	2:30pm
Duration:	1.5hours
Weather Conditions:	Partly Cloudy, 15C

Field notes can be found in Appendix A

3.2 Qualifications of Investigators

The site investigation was conducted by Amy Witowski, Terrestrial and Wetland Biologist and Katherine Ryan, Terrestrial and Wetland Biologist.

Amy Witowki contains a Masters of Science in Biology where she specialized in bryophytes. Mrs. Witowski has worked with a variety of government and private agencies in the Biology field from consulting as a biologist at MMM Group Inc. to a Resource Technician at the MNR. Amy has experience conducting stream crossing and water quality inventories. She also has strong botony skills and experience conducting environmental assessments.

With a background in Environmental Science (BSc) and Ecosystem Management (Diploma)

Katherine began her experience at the Otonabee Region Conservation Authority as a Water Resource Technician. Katherine specifically conducted assessments on stream velocity and water quality. Ms. Ryan has worked as a terrestrial and wetland biologist for NEA for almost two years. At NEA, working on projects all over Ontario, Katherine conducts site assessments including wetland delineation, biological inventories (birds, amphibians, terrestrial and wetland plants etc.) and environmental monitoring.

3.3 Methodology

Information from the Records Review (NEA, 2012) was used to locate potential water body features, as identified by the literature reviewed. Features identified on or within 120 meters from the project location were located. Physical site investigations ground truthed the water body features. The entire project area was searched, in addition to lands within 120 meters from the project location boundary that were located on the property or visible by road. Photographs will be taken to confirm the presence or absence of water body features.

Locations will be documented and marked using a handheld Global Positioning System (GPS) device. The plant and animal composition as well as the ecosystem of the land and water investigated were also documented. The type of water body found was documented (lake, permanent watercourse, intermittent watercourse, seep).

4.0 Site Investigation - Results

The records review identified one water body feature (stream) identified south east of the project location boundary. Site investigations confirmed the water body feature on the North-West corner of the property. An additional drainage feature was identified on the northern limits of the property running down the fenceline and beneath Highway 401. No other water bodies were identified within the 120 meters surrounding the project location boundary.

4.1 Site Description

The project location is found within the Port Granby-Wesleyville-Port Britain Creek Watershed. The landscape is made up of primarily agricultural fields with some wetland and woodland features, and a creek running along the North-West corner of the property. The project location is bounded by Highway 401 to the North, Mail road to the South and Wesleyville Road to the east. Farms exist directly to the west of the property. The agricultural fields on the property were planted in corn. The site is generally flat in nature with an upward slope to the north and a creek valley to the north-west. The site investigation confirmed the presence of the watercourse running through the North-West corner of the property, an additional drainage feature was

identified in the site investigation running along the fenceline on the north-central edge of the property and flowing under Highway 401.

4.2 Water Body Features

4.2.1 Permanent Streams

A permanent stream can be defined within subsection 1(1) of the REA regulation as " a stream that continually flows in an average year" (O. Reg. 359/09). One permanent stream existed in the north-west corner of the property. This stream was a tributary of Port Britain Creek. The watercourse identified in the Records Review was confirmed in the field.

The project location is approximately 60 m from the top of stream bank. The watercourse runs north-east, south-west clipping the north-west corner of the property. The stream exists in a valley surrounded by forested area and marshlands at a lower elevation than the agricultural fields that make up of the majority of the property. The watercourse meanders across the corner of the property heading west while retreating into a culvert within a large pile of boulders that existed between the property and the neighbouring property. On the east end of the stream located on the property the watercourse narrowed and flowed into a large culvert running beneath Highway 401 and moving towards the main branch of Port Britain creek.

The portion of the Creek located on property was no more than 1 m wide and 0.5 m deep. Wetlands exist surrounding a portion of the creek dominated by horsetail and willow shrub species. Various other marsh plants were found in these lands. A mixed forest existed to the south of the creek and along the valley walls. Although there were no fish species observed during the field visit, this Creek offers suitable habitat for fish.

This permanent stream meets the definition of a *water body*, as defined in the REA regulation. A portion of this Creek is situated within the regulated 120 m setback from the project location.

Photo 1& 2. Permanent stream (Tributary of Port Britain Creek) flowing on the North-West corner of the property

4.2.2 Intermittent Streams

An intermittent stream can be defined in subsection 1(1) of the REA regulation 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 soil for their survival" (O. Reg 359/09).

The Records Review did not identify any intermittent streams on or within 120 meters of the property. The results from the Records Review were confirmed in the field. No intermittent streams were found under the definition above located on or within 120 m of the project location.

4.2.3 Lakes

Kettle lakes are defined as "a depression formed by glacial action and permanently filled with water", a lake trout lake can be defined as "a lake that has been designated by the Ministry of Natural Resources for lake trout management, as set out in records maintained by and available from the Ministry" (O. Reg. 359/09).

The Records Review (NEA, 2012) identified no lakes within 120 m of the project location. The results from the Records Review were confirmed in the field. No lakes as found under the definitions above were located within 120 m from the project location.

4.2.4 Seepage Areas

Subsection 1(1) of the REA regulation identified seepage areas as "a site of emergence of ground water where the water table is present at the ground surface, including as spring" (O. Reg. 359/09).

The Records Review (NEA, 2012) identified no seepage areas within the 120 m surrounding the project location. This was confirmed in the site investigation. No seepage areas were identified during the site investigation found within 120 m of the project location.

4.2.5 Other Water Features

One drainage feature existed on the North-central edge of the property identified in the site investigation. This feature was a drainage feature accommodating the agricultural fields. Evidence of water at one time existed, running perpendicular to Highway 401 moving from the agricultural lands. During the site investigation the flowing stream ran along the fenceline moving west-east and into a large culvert running under Highway 401. This feature was not identified in the Records Review (NEA, 2012). This drainage feature connected with Port Britain Creek on the North side of the 401, however did not extend very far into the property at the time

of the site investigation. This was located in the 120 m set-back from the project location. The feature was no greater than 0.5 m wide with a depth of less than 0.25 m. The feature ran through the corn field on the property and off property contained through a grassy ditch. Cattails existed within portions of the feature and in the entrance to the culvert. No fish species were observed in this feature and as it is very shallow would not provide suitable fish habitat.

No other water features were identified within 120 m of the project location.

Photo 3 & 4. Culvert and watercourse running under Highway 401 on the northern edge of the property

5.0 Conclusions

The Site Investigation Report confirmed that the project location was within 120 m of the average annual high water mark of a permanent or intermittent stream.

In compliance with section 39 of O. Reg. 359/09, no person shall construct, install or expand a REGF in or within 30 m of:

a) the average annual high water mark of a lake;
b) the average annual high water mark of a permanent or intermittent stream; or
c) a seepage area

This project plan is in compliance with the above regulation.

Section 40 prohibits a REGF within 300 m of the average high water mark of a lake trout lake, or within 120 m of:

a) the average annual high water mark of a lake (other than a lake trout lake);
b) the average annual high water mark of a permanent or intermittent stream; or
c) a seepage area

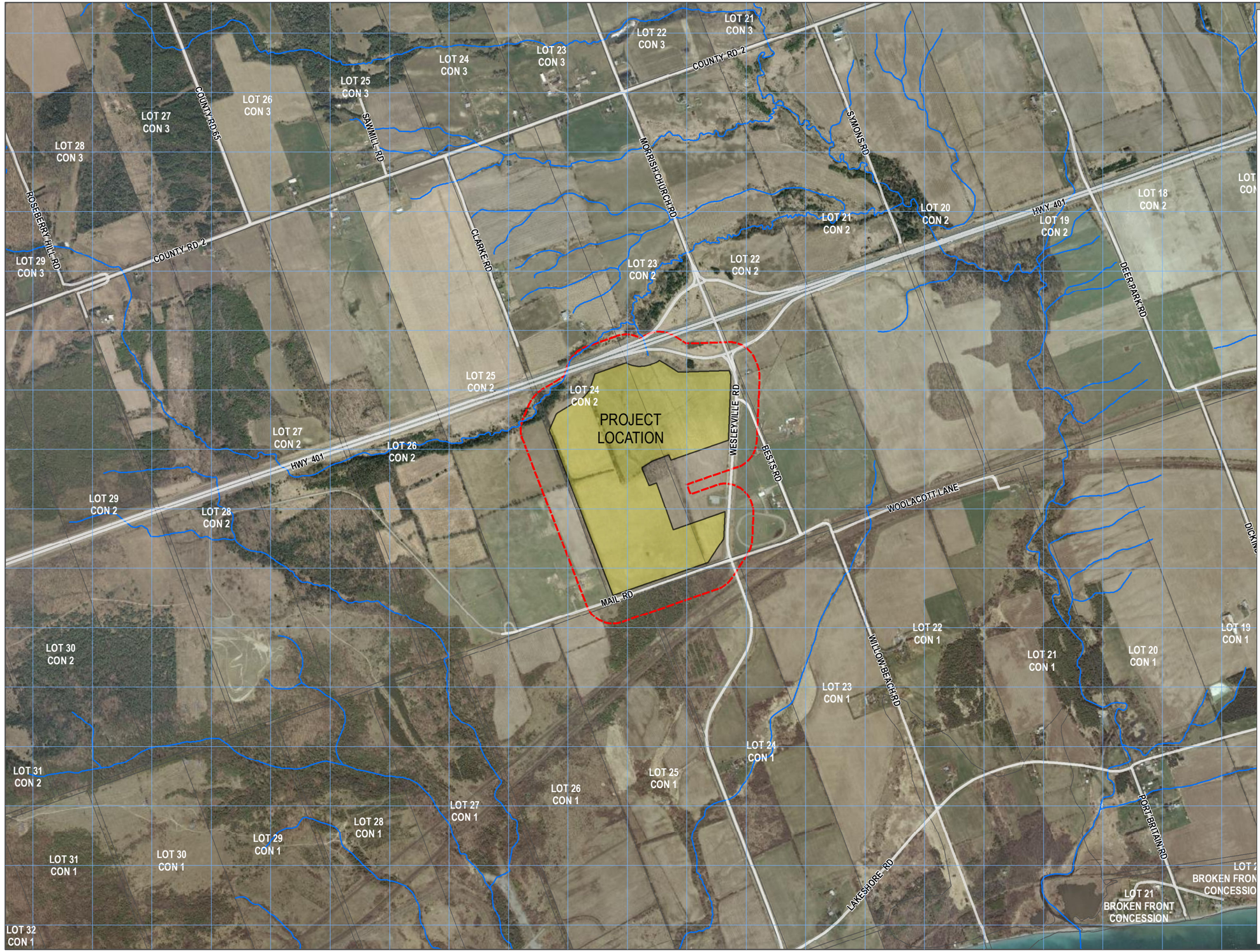
This project plan does not comply with section 40 of O. Reg 359/09, as a result a development may occur within the set-back so long as a Water Bodies Report is completed to assess the negative environmental effects of the project on the water body and on lands within 30 m of the water body.

The proceeding section will fulfill the requirements of the Water Bodies Report as a result of the project location being present within the 120 m set-back of a watercourse.

Table 3. Summary of Site Investigation Results

Required determinations of Water bodies in proximity to project location boundary		
Is the project location in a water body	No	No corrections are required to the Water Body Records Review Report (NEA, 2012). The site investigation confirmed the project location was not in a water body
Is the project location 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 corrections are required to the Water Body Records Review Report (NEA, 2012). The site investigation confirmed the project location was not 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.
Is the project location within 300 m of the average annual high water make of a lake trout lake that is at or above development capacity	No	No corrections are required to the Water Body Records Review Report (NEA, 2012). The site investigation confirmed the project location was not within 300 m of the average annual high water mark of a lake trout lake that is at or above development.
Is the project location within 120 m of the average annual high water mark of a permanent or intermittent stream	Yes	No corrections are required to the Water Body Records Review Report (NEA, 2012) The watercourse cutting through the north-west corner of the property was confirmed by the site investigation to be within 120 m from the project location boundary. An additional feature was identified during the site investigation on the north-central edge of the property, also located within the 120 m setback.
Is the project location within 120 m of a seepage area	No	No corrections are required to the Water Body Records Review Report (NEA, 2012). The site investigation confirmed the project location was not within 120 m of a seepage area.

1:16,000



NAD83 UTM ZONE 17N

NIBLETT ENVIRONMENTAL ASSOCIATES INC.

FIGURE 1: WATERBODY FEATURES & PROJECT PROPERTY

17N 709253 4869455
Revision 1
10-066
HOPE TOWNSHIP
PETERBOROUGH DISTRICT

1 centimeter = 160 meters

Meters
0 220 440 880

LEGEND

Road Classes
- Local
- Arterial
- Collector
- Expressway / Highway
- Freeway

Project Specific
- Study Property
- 120m Project Area

Hydrology
- Watercourse

Municipal
- Lot Parcel
- Owner Parcel

Email: mail.niblett.ca
Phone: 705.878.9399
GIS/Mapping Phone: 705.878.9399 x207
www.niblett.ca

6.0 References

Fisheries and Oceans Canada. 2007. Definition of Levels of Agreement with Conservation Authorities in Ontario. Available on-line at: http://www.dfo-mpo.gc.ca/regions/central/pub/municipal-class-niveaux-minicipaux-on/section8-eng.htm.

Government of Ontario. 2009. Ontario Regulation 359/09 made under the Environmental Protection Act 2007, Renewable Energy Approvals under Part V.0.1 of the Act. September 8, 2009 version. Printed in the Ontario Gazette: October 10, 2009. Available on-line at Http://www.e-laws.gove.on.ca/htym/source/regs/english/2009/elaws_src_regs_r09359)e.htm

Ganaraska Region Conservation Authority. 2007. Ganaraska Region Conservation Authority Watershed Map. Available on-line at: http://www.grca.on.ca/downloads/maps/GRCA_Jurisdition_Map.pdf. Accessed on April 10, 2012.

Ministry of Natural Resources. 2008. Land Information Ontario. Natural Feature Layers. Available on-line at: http://www.mnr.gov.on.ca/en/Business/LIO/index.html. Accessed April 16, 2012.

Ministry of Natural Resources. 2008. Land Information Ontario. Agriculture Information Atlas. Available on-line at: http://www.lio.ontario.ca/imf-ows/imf.jsp?site=aia_en. Accessed April 10 2012

Natural Resources Canada. 2010. Topographic Maps. Atlas of Canada. Available on-line at: http://atlas.nrcan.gc.ca/site/english/maps/topo/map. Accessed April 10 2012

The Municipality of Port Hope. 2009. The Municipality of Port Hope Official Plan. Available on-line at: http://www.porthope.ca/en/doingbusiness/resources/OP_Text_Dec_4-08.pdf. Accessed April 10, 2012

APPENDIX A

Site Investigation Field Notes

Pennenergy - Van Dorp
May 2, 2012
KR, AW
Partly cloudy, 15°C
on site: 1-2:30

- several drainage ditches along Mail Road, several culvert crossings south of the property in the western corner however no evidence of continuation anywhere - becomes dry as you move west on Mail Rd.

- An additional flowing drainage feature exists in the North - central edge of the property the feature ran west-east in sharp turn flowing under the 401
  WP 179
  - swale becomes intermittent @ WP 181
  - connects up to stream network on N side of 401

- A ditch follows the 401 w cattails catching water from the highway higher elevation as we move west - no standing water - is not connected to stream network in NW corner

- stream on Property in NW corner WP 182-203, stream splits @ WP 186

WP 182 - stream is surrounded by cattails + slender Willow

- Marsh on N edge of stream dominated by water horsetail.

- water hemlock, marsh marigold exist adjacent stream

- coyote trails evident