Agricultural Land Evaluation
In Support of a Proposal for a Ground Mounted Solar PV

CCS Project No. 2602
Date: May 26, 2015

Prepared For: Invenergy Canada
Prepared By: Clark Consulting Services

Clark Consulting Services (CCS) was retained by Invenergy Canada to prepare an Agricultural Land Evaluation for a proposed solar PV project known as Killarney Bay Solar in support of an application to the Independent Electricity System Operator (IESO) under the Large Renewable Procurement (LRP | RFP) program, and have created a report in accordance with IESO and OMAFRA guidelines.

In accordance with project eligibility, CCS conducted a review of available mapping related to Official Plan designation and agricultural land capability as required. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) publish the latest official Canada Land Inventory maps that are used to verify soil classification for the purpose of IESO Renewable Energy applications. During our review of these maps we found that Project Killarney Bay Solar is said to lie within Class 6 soils and the property is designated "Rural", and so the project meets the requirements of the IESO and no site visit is required.

This evaluation has been prepared under the guidelines of the IESO FIT rules 4.0. The requirements for a soils evaluation under 4.0 are the same as those under LRP rules where official plan information is not adequate to qualify the lands.

In preparing for presentation of this project to The City of Kawartha Lakes the proponent, Invenergy Canada, is aware of Council Resolution CR 2013-511, which requires an Agricultural Impact Assessment where lands are proposed for solar use and are classed CLI 6 or better. This report is an attachment to the Agricultural Impact Assessment required by the City.

1. LOCATION MAP – FIGURE 1

The Property is located in Lot 9, Concession 4, in the geographic Township of Fenelon, City of Kawartha Lakes, at Killarney Bay Road north of Cambray Road. Property size is estimated at 74 hectares (183 ac). The location is illustrated in Figure 1 - Location, created from Google Maps.
2. **SITE DESCRIPTION**

The west half of the site is open and flat with numerous depressed wet areas. There are piles of rock shards throughout the western portion of the site due to an early attempt to cultivate the lands. There is exposed bedrock on the surface of a substantial portion of the property. The site dips along an irregular north south ridge into an extensive wooded wet area.

3. **EVALUATION PROCESS**

The IESO Draft FIT Rules Version 4.0, released April 28, 2015, provides the rules to be followed when making a FIT application. IESO Draft FIT Rule 4.0 requires that where an Application is in respect of a Non-Rooftop Solar Project evidence should be provided to show that the Site is not located on CLI Class 1, 2, 3, or Organic Lands. Section 2.3 (a) says the Project must not be located on Specialty Crop Lands; Section 2.3 (b) must not have its Site located on CLI Organic Lands; or Section 2.3 (c) and (d) must not have its Site located on CLI Classes 1, 2, or 3 Lands. Some exclusions apply. Section 3.8 requires that the Application must include evidence including a current map from Canada Land Inventory showing the CLI Quadrant Number and Property on which the Project is located; where Properties are located in Municipalities with Specialty Crop Areas, a current map showing the Specialty Crop Areas and the location of the Property; and if the Project’s site is on lands described in Section 2.3 (c) or (d), a land evaluation study demonstrating that no part of the Site is located on CLI Organic 1, 2, or 3 Lands.
This report sets out the results of a desktop study for:

- a review of the Agricultural Information Atlas from Land Information Ontario

The County of Victoria and City of Kawartha Lakes do not have Specialty Crop Areas as defined by OMAFRA, and so no Specialty Crop Mapping is provided with this report.

4. **SOILS MAPPING – FIGURE 2**

The Soil Map for Victoria County, completed in 1957, provides a description and mapping of soils for the subject lands. The surface deposits that occur owe their origin to the action of any one or combinations of three forces, namely, ice, water or wind. In this region the surface deposits have originated almost entirely as the result of the work of glacial ice and of still and moving water. The unsorted deposits laid down by moving ice, and which are called till, cover by far the greatest area of the County.

<table>
<thead>
<tr>
<th>Soil Name</th>
<th>Parent Materials</th>
<th>Characteristics</th>
<th>CLI Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otonabee loam (Ol)</td>
<td>Calcareous loam and sandy loam till</td>
<td>Good to excessive drainage</td>
<td>1&gt;4T</td>
</tr>
<tr>
<td>Farmington loam (Fl)</td>
<td>Loamy till over limestone rock</td>
<td>Variable drainage</td>
<td>6R</td>
</tr>
<tr>
<td>Muck (M)</td>
<td>Decomposed organic deposits</td>
<td>Very poor drainage</td>
<td>0</td>
</tr>
</tbody>
</table>
Otonabee loam:
Otonabee soils are important soils in Victoria County. They are well drained and tend to be of rolling topography in the Lindsay vicinity. The parent material is a sandy loam textured glacial till with a moderate amount of stone. The material is principally derived from limestone and so is calcareous. On the steeper slopes, the finer material will be carried away leaving a more stony soil.
FARMINGTON LOAM:
Farmington soils have less than one foot of glacial till over limestone rock. The soils are on flat level table rock with occasional escarpments or rock ledges.

MUCK:
The Muck soils are found in old glacial spillway channels and depressed areas. They consist of at least 18 inches of organic materials (partially decomposed trees and sedges) over mineral soil. Muck soils are usually covered by tree vegetation.

5. CLI CAPABILITY MAPPING – FIGURE 3

The Canada Land Inventory provides a Capability for Agriculture based upon 7 classes and a series of sub classes related to limitations of soils for agricultural production. The 7 classes rate the soil on the severity of limitation to cultivation beginning with Class 1 which has no limitations and progressing to Class 7 which cannot be cultivated. The published capability rating was based upon the Soils Mapping.

The Agricultural Information Atlas, published by the Ministry of Natural Resources, provides current Canada Land Information mapping over the subject property. Figure 3 shows the Agricultural Information Mapping showing Property Killarney Bay Solar with CLI information. This shows the Property is located on CLI Class 6 soils, and that the Preferred Site will be located entirely on CLI Class 6 soils.
6. **CLI FIT CAPABILITY MAPPING – FIGURE 4**

An application to the IESO often requires the Property and Site to be shown on a current CLI FIT map. This mapping is the official IESO/OPA CLI mapping and is maintained by the Ontario Ministry of Agriculture, Food and Rural Affairs. An excerpt from the CLI FIT Map Number 31D7 is reproduced as **Figure 4**. This mapping shows the Property is comprised of Classes 4-7 lands.
7. **CAPABILITY MAPPING – FIGURE 5**

Our detailed capability assessment of the property as well as the proposed site is presented as *Figure 5*. The Test Pit documentation is attached to this report as "Test Pit Logs". Based upon this review and our site evaluation, Clark Consulting Services can confirm that the proposed property does not include any Classes 1, 2, or 3 soils.
Figure 5 – Capability Mapping
8. CONCLUSIONS

For the purpose of an application for a proposed solar farm over 10 kW, Clark Consulting Services was asked to complete an agricultural evaluation of a Property as part of the required documentation in support of a FIT application to the OPA for a ground mounted solar PV project greater than 10kW.

CCS reviewed the Canada Land Inventory mapping, found in the Agricultural Information Atlas, as shown on Figure 3, and found the property is comprised of Class 6 soils. CCS then reviewed the CLI FIT mapping, Quadrant 31D7 as shown on Figure 4, and found the Property and Preferred Site is located within Class 4-7 lands.

From the Agricultural Land Evaluation, Desktop Review, of property located Lot 9, Concession 4, in the geographic Township of Fenelon, City of Kawartha Lakes, at Killarney Bay Road north of Cambray Road, CCS found that no part of the Project Property is located on Organic soils or Specialty Crop Lands, and that the official CLI FIT mapping published by OMAFRA shows the entire property as Classes 4-7 lands. From the detailed site visit CCS agrees with the Canada Land Information classification of the property as Class 6R and confirms that the proposed Site is actually Class 6 lands with generally shallow soils and pockets of deeper soils between the rocks.

Sincerely,

Bob Clark, P. Eng., P. Ag., MCIP, RPP, OLE
Principal Planner

Attachment A - Test Pit Logs

Z:\2602\Ag Land Evaluation Report.docx
ATTACHMENT “A”

Test Pit Logs

Project: Killarney Bay
CCS: 2602
Soil Dig Date: April 28, 2015
Weather: Clear skies, very windy.

Test Pit No. 1
Co-ordinates: 44.4340, -78.8073
Surface Condition: rough pasture with stones
A Horizon: 0-10" dark brown clay loam
Notes: Water in the hole at 6"
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 2
Co-ordinates: 44.4350, -78.8078
Surface Condition: rough pasture
A Horizon: 0-4" brown clay loam
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 3
Co-ordinates: 44.4350, -78.8082
Surface Condition: rough pasture, frequent wet depressed areas
A Horizon: 0-8" black clay loam
Horizon B: 8"+ light brown clay,
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 4
Co-ordinates: 44.4380, -78.8088
Surface Condition: surface rock and wet
Horizon A: 0-6" brown silt loam
Horizon B: 6"+ light brown clay
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R
Test Pit No. 5
Co-ordinates: 44.4378, -78.8076
Surface Condition: surface rock and wet
Horizon A: 0-6" brown silt loam
Horizon B: 6"+ light brown clay
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 6
Co-ordinates: 44.4370, -78.8067
Surface Condition: surface rock and wet
Horizon A: 0-6" dark brown clay loam
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Visual No. 7
Surface Condition: surface rock and wet
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 8
Co-ordinates: 44.4341, -78.8056
Surface Condition: rough pasture
A Horizon: 0-12" very wet clay loam
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 9
Co-ordinates: 44.4348, -78.8044
Surface Condition: rough pasture
A Horizon: 0-6" brown sandy loam
B Horizon: 6-14" reddish brown fine sand with stones
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Visual No. 10
Surface Condition: surface rock and wet
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 11
Co-ordinates: 44.4373, -78.8054
Surface Condition: probed 0" to rock- rough pasture, surface rock, very wet
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R
Test Pit No. 12
Co-ordinates: 44.4383, -78.8060
Surface Condition: rough pasture, surface rock, very wet
Horizon A: 0-4" dark brown loam, wet
Horizon B: 4-14" light brown clay loam with stones
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 13
Co-ordinates: 44.4390, -78.8040
Surface Condition: rough pasture, surface rock, very wet
Horizon A: 0-8" dark brown silt loam
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 14
Co-ordinates: 44.4379, -78.8042
Surface Condition: surface rock
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 15
Co-ordinates: 44.4367, -78.8027
Surface Condition: some stones on surface, very wet depressed area
Horizon A: 0-8" brown sandy loam
Horizon B: 8-30" light brown silty clay
Horizon C: 30"+ topsoil
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Visual No. 15
Surface Condition: dense surface stone
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Test Pit No. 16
Co-ordinates: 44.4354, -78.8025
Surface Condition: surface rock, with steep slope behind
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R
Test Pit No. 17
Co-ordinates: 44.4357, -78.8015
Surface Condition: surface rock with some topsoil
Horizon A: 0-10" fine sandy loam
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Visual No. 21
Surface Condition: wet wooded area
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Visual No. 22
Surface Condition: wet wooded area
Soil Type: Farmington Loam
Soil Capability for Agriculture: 6R

Visual No. 23
Surface Condition: wet wooded area
Soil Type: Muck
Soil Capability for Agriculture: O

Visual No. 24
Surface Condition: wet wooded area
Soil Type: Muck
Soil Capability for Agriculture: O