



**DILLON**  
CONSULTING

LOYALIST SOLAR PROJECT

# Project Description Report

# Table of Contents

<b>1.0</b>	<b>Introduction</b>	<b>1</b>
<b>2.0</b>	<b>The Proponent</b>	<b>3</b>
<b>3.0</b>	<b>Project Location</b>	<b>4</b>
<b>4.0</b>	<b>Authorizations</b>	<b>7</b>
<b>5.0</b>	<b>Project Information</b>	<b>9</b>
5.1	Nameplate Capacity and Classification .....	9
5.2	Land Ownership .....	9
5.3	Energy Sources .....	10
5.4	Project Components .....	10
5.4.1	Operational Flexibility.....	10
5.4.2	PV Panels and Mounting System .....	11
5.4.3	Inverter Stations and Equipment .....	11
5.4.4	Electrical Collector System .....	12
5.4.5	Connection Line .....	12
5.4.6	Substation and Other Equipment.....	12
5.4.7	Access Roads.....	12
5.4.8	Perimeter Fence and Lighting.....	13
5.4.9	Control Building, SCADA and Communication Tower .....	13
5.4.10	On-Site Temporary Storage and Construction Areas .....	13
5.4.11	Operations and Maintenance Building.....	13
5.4.12	Water Crossings.....	13
5.4.13	Stormwater Management Installations.....	13
5.4.14	Water Supply .....	14
5.4.15	Sewage Disposal .....	14
5.4.16	Other Equipment .....	14
5.5	Project Activities .....	14
5.5.1	Construction .....	14
5.5.2	Operation and Maintenance .....	17
5.5.3	Decommissioning .....	19

<b>6.0</b>	<b>Description of Environmental Effects</b>	<b>21</b>
6.1	Archaeology and Cultural Heritage .....	21
6.1.1	Archaeological Assessment .....	21
6.1.2	Cultural Heritage Assessment .....	21
6.2	Natural Heritage Resources .....	22
6.2.1	Species at Risk .....	24
6.3	Water Bodies.....	25
6.4	Groundwater.....	27
6.5	Air, Odour and Dust .....	27
6.6	Noise .....	28
6.7	Land Use and Resources .....	28
6.8	Provincial and Local Infrastructure .....	28
6.9	Public Health and Safety .....	29
6.10	Areas Protected under Provincial Plans and Policies.....	29
<b>7.0</b>	<b>Benefits of the Project</b>	<b>30</b>

### Figures

Figure 1: General Project Location.....	5
Figure 2: Project Location and Natural Features .....	6

### Tables

Table 1: Anticipated REA Schedule for the Loyalist Solar Project .....	1
Table 2: Checklist for Requirements under O.Reg. 359/09 – Project Description Report .....	2
Table 3: Possible Authorizations and Requirements for the Project.....	7
Table 4: Construction Activities .....	15
Table 5: Operations and Maintenance Activities.....	18

## 1.0 Introduction

Loyalist Solar LP, a limited partnership between Mohawks of the Bay of Quinte and BluEarth Renewables Inc., (together the "Proponent"), proposes to develop a non-rooftop solar facility with a maximum nameplate capacity of 54 megawatts alternating current ("MW<sub>AC</sub>"), located in the Township of Stone Mills, County of Lennox & Addington, Ontario (**Figure 1**). The renewable energy facility will be known as the Loyalist Solar Project (the "Project").

The Proponent submitted a proposal to the Independent Electricity System Operator ("IESO") under the Large Renewable Procurement I ("LRP") process and was subsequently awarded a LRP contract by the IESO to generate electricity. The Project will now be subject to a number of approvals including, among others, *Ontario Regulation 359/09* ("O. Reg. 359/09") – Renewable Energy Approval ("REA") under Part V.0.1 of the Ontario *Environmental Protection Act*. The REA process requires proponents to undertake several studies and consultation activities before an application can be submitted to the Ministry of the Environment and Climate Change ("MOECC") for review and approval. The anticipated schedule for the Loyalist Solar Project is presented below:

**Table 1: Anticipated REA Schedule for the Loyalist Solar Project**

Activity	Anticipated Date
Public Meeting #1	June 29, 2016
Field studies and engineering assessments	Spring to Fall 2016
Public Meeting #2	January 2017
REA application submission to the MOECC	February 2017
MOECC review of the REA application	February – September 2017
REA approval by the MOECC	September 2017
Construction of the Project	October 2017 – October 2018
Commercial operation of the Project	November 2018

This *Project Description Report* ("PDR") provides an overview of the proposed project including the Project Location, components, activities and potential negative environmental effects as detailed in **Table 2**.

**Table 2: Checklist for Requirements under O.Reg. 359/09 – Project Description Report**

<b>Required Documentation</b>	<b>Location in Report</b>
Any energy sources to be used to generate electricity at the renewable energy generation facility.	<b>Section 5.3, Energy Sources</b>
The facilities, equipment or technology that will be used to convert the renewable energy source or any other energy source to electricity.	<b>Section 5.4, Project Components</b>
If applicable, the class of the renewable energy generation facility.	<b>Section 5.1, Nameplate Capacity and Classification</b>
The activities that will be engaged in as part of the renewable energy project.	<b>Section 5.5, Project Activities</b>
The name plate capacity of the renewable energy generation facility	<b>Section 5.1, Nameplate Capacity and Classification</b>
The ownership of the land on which the Project Location is to be situated.	<b>Section 5.2, Land Ownership</b>
If the person proposing to engage in the project does not own the land on which the Project Location is to be situated, a description of the permissions that are required to access the land and whether they have been obtained.	<b>Section 4, Authorizations</b>
Negative environmental effects that may result from engaging in the project.	<b>Section 6, Description of Environmental Effects</b>
If the project is in respect of a Class 2 wind facility and it is determined that the Project Location is not on a property described in Column 1 of the Table to section 19 of O. Reg. 359/09, a summary of the matters addressed in making the determination.	N/A – The facility is not a Class 2 wind facility.
If the project is in respect of a Class 2 wind facility in respect of which section 20 applies and it is determined that the Project Location does not meet one of the descriptions set out in subsection 20 (2) or that the Project Location is not in an area described in subsection 20 (3), a summary of the matters addressed in making the determination.	N/A – The facility is not a Class 2 wind facility.
An unbound, well-marked, legible and reproducible map that is an appropriate size to fit on a 215 millimetre by 280 millimetre page, showing the Project Location and the land within 300 metres of the Project Location.	<b>Figure 2</b>

## 2.0 The Proponent

The Proponent is coordinating and managing the approvals process for the Project. The contact is:

Full Name of Company:	<i>Loyalist Solar LP, c/o BluEarth Renewables Inc.</i>
Prime Contact:	<i>Tom Bird, Director, Regulatory</i>
Address:	<i>34 Harvard Road, Guelph, ON, N1G 4V8</i>
Telephone:	<i>1-844-214-2578</i>
Email:	<i>projects@bluearth.ca</i>

Dillon Consulting Limited (“Dillon”) has been retained by the Proponent to prepare the REA application for the Project. The contact at Dillon is:

Full Name of Company:	<i>Dillon Consulting Limited</i>
Prime Contact:	<i>Megan Bellamy, Project Manager</i>
Address:	<i>235 Yorkland Boulevard, Suite 800, Toronto, ON, M2J 4Y8</i>
Telephone:	<i>(416) 229-4646 ext. 2423</i>
Fax:	<i>(416) 229-4692</i>
Email:	<i>MBellamy@dillon.ca</i>

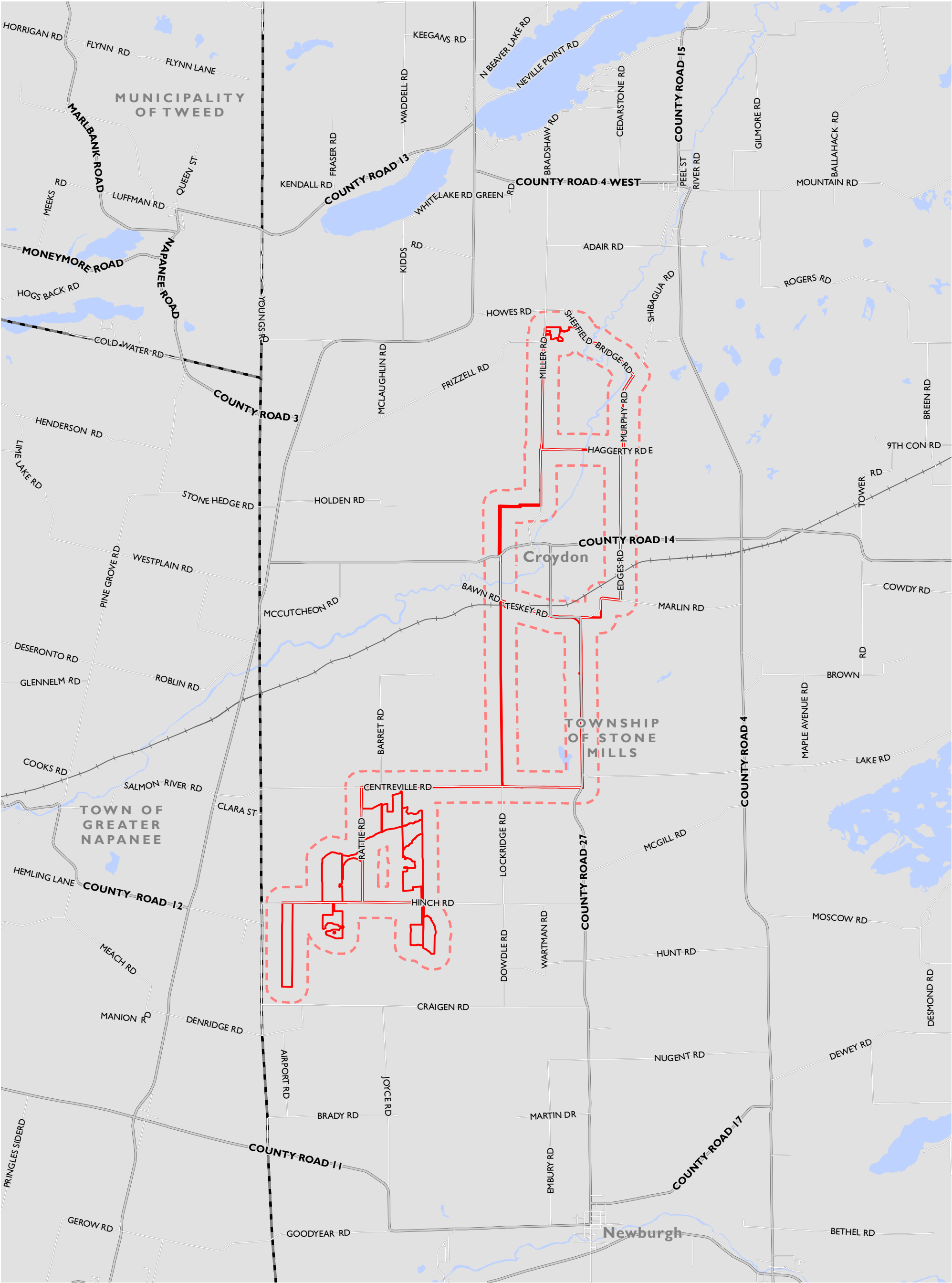
## 3.0 Project Location

This Class 3 Solar Facility (as defined in **Section 5.1**) is to be located within the Township of Stone Mills, in the County of Lennox & Addington, approximately nine kilometres north of Napanee, Ontario. The Project Location, situated on multiple privately owned parcels, consists of approximately 200 hectares (494 acres) and is contained within an area generally bounded on the north by Howes Road, Craigen Road to the south, County Road 27 and Murphy Road to the east, and County Road 41 to the west. It has an approximate centroid at the following geographic coordinates:

- Latitude: 44°22'3.382" N
- Longitude: 76°58'19.543" W

**Figure 1** shows the general location of the Project. The term “Project Location” is defined in *Ontario Regulation 359/09* to be “a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project”. The specific facility components making up the Project Location and their exact locations will be determined through a detailed engineering design process. For more information, see **Section 5.4.1**, Operational Flexibility. **Figure 2** shows the Project Location as the boundary within which all Project components will be located. **Figure 2** also identifies known natural features and water bodies within 300 m of the Project Location and identifies the required study area for the purpose of assessing potential environmental effects.

Site plan layouts are provided in the *Design and Operations Report*.



**BluEarth Renewables Inc.**  
LOYALIST SOLAR LP

**General Project Location**  
FIGURE 1

- Railway
- Project Location Boundary
- Project Location 300 m Area of Investigation
- Municipal Boundary

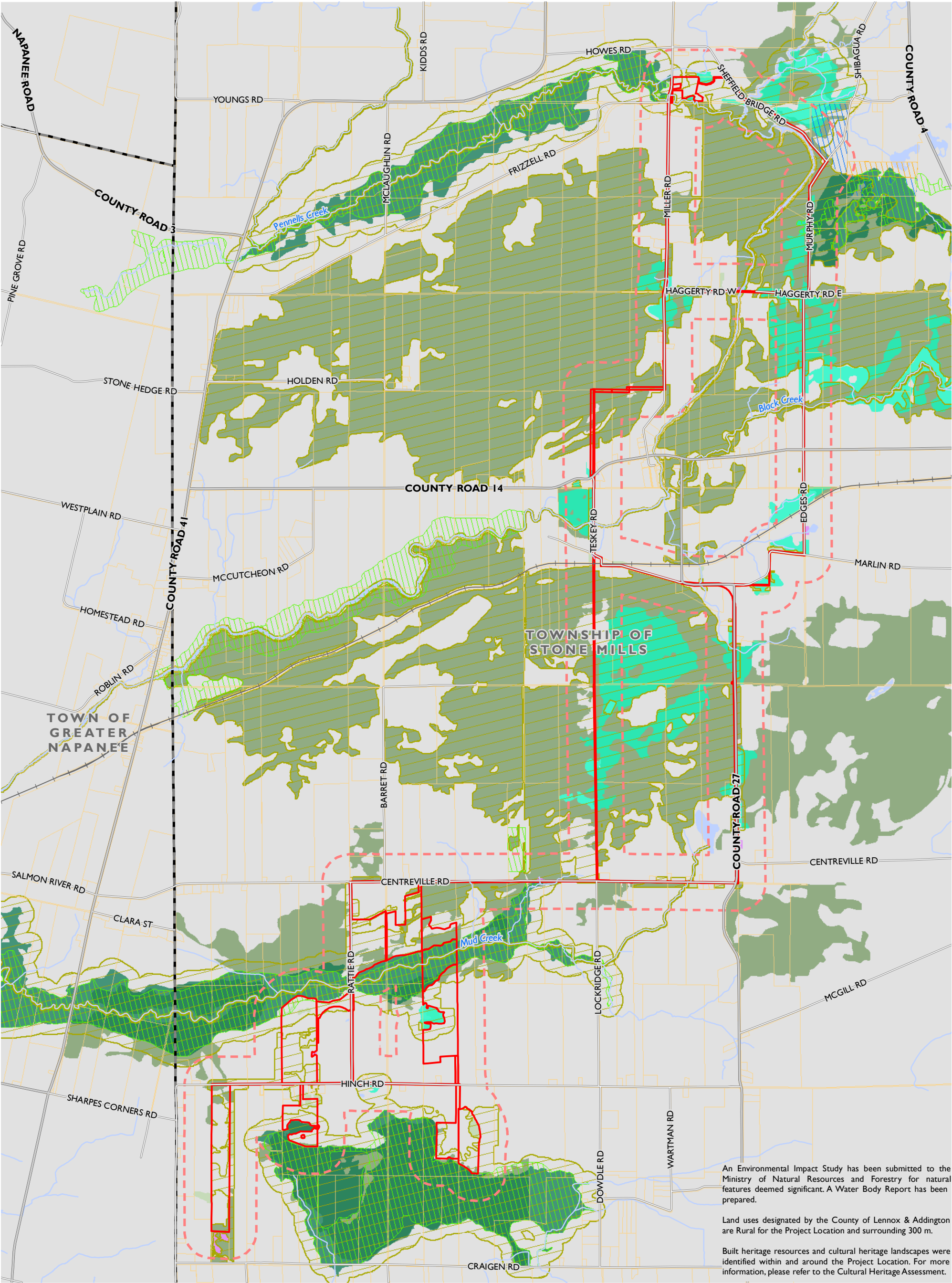


MAP CREATED BY: GM  
MAP CHECKED BY: JP  
MAP PROJECTION: NAD 1983 UTM Zone 18N



PROJECT: 163674    STATUS: DRAFT    DATE: 2017-01-25





An Environmental Impact Study has been submitted to the Ministry of Natural Resources and Forestry for natural features deemed significant. A Water Body Report has been prepared.

Land uses designated by the County of Lennox & Addington are Rural for the Project Location and surrounding 300 m.

Built heritage resources and cultural heritage landscapes were identified within and around the Project Location. For more information, please refer to the Cultural Heritage Assessment.

BluEarth Renewables Inc.

LOYALIST SOLAR LP

Project Location and Natural Features

FIGURE 2

- Railway

Mapped Watercourse

Project Location Boundary

Project Location 300 m Area of Investigation

Municipal Boundary

Parcel

Environmental Protection

Extractive Industrial Pits and Quarries

Waste Management

Significant/Treated as Significant Wildlife Habitat

Water Body

Significant Wetland

Assumed Provincially Significant Wetland

Non Significant Wetland

Significant Woodland

Non Significant Woodland

\*All other lands within the 300 m Setback are zoned Rural.

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MAP CREATED BY: GM  
MAP CHECKED BY: JP  
MAP PROJECTION: NAD 1983 UTM Zone 18N

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500

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PROJECT: 163674

STATUS: DRAFT

DATE: 2017-01-25

FILE LOCATION: I:\GIS\163674 - Loyalist Solar\mxd\PDR\Figure 2 Project Location and Natural Features.mxd

## 4.0 Authorizations

**Table 3** provides a list of authorizations (applicable permits, agreements, licenses, approvals and confirmation letters) that may be required in addition to the REA. The necessary authorizations will be obtained prior to construction of the Project. Information contained in **Table 3** is preliminary and will be refined as the REA process progresses.

**Table 3: Possible Authorizations and Requirements for the Project**

Authority, Agency or Governing Body	Requirement
Fisheries and Oceans Canada ("DFO")	<ul style="list-style-type: none"> <li>• <i>Fisheries Act</i> authorization for watercourse crossings (or Letter of Advice)</li> </ul>
Electrical Safety Authority ("ESA")	<ul style="list-style-type: none"> <li>• Connection Authorization</li> <li>• Safety Inspection</li> </ul>
Hydro One Networks Inc. ("HONI")	<ul style="list-style-type: none"> <li>• Customer Impact Assessment - Integration of project within HONI system and effects on customers</li> <li>• Connection Cost Recovery Agreement</li> </ul>
Independent Electricity System Operator ("IESO")	<ul style="list-style-type: none"> <li>• Authorization as market participant</li> <li>• Registration of facility</li> <li>• Registration of metering service</li> <li>• System Impact Assessment ("SIA") - Integration of Project with Hydro One's transmission infrastructure</li> <li>• Connection Assessment Approval ("CAA")</li> <li>• Key Development Milestones</li> </ul>
Landowners	<ul style="list-style-type: none"> <li>• Lease Agreements</li> </ul>
Ministry of the Environment and Climate Change ("MOECC")	<ul style="list-style-type: none"> <li>• Environmental Activity and Sector Registry ("EASR") filing for dewatering during construction</li> </ul>
Ministry of Natural Resources and Forestry ("MNRF")	<ul style="list-style-type: none"> <li>• Water Crossings Work Permit under Regulation 453/96 of the <i>Public Lands Act</i></li> <li>• Species at Risk Permit under the <i>Endangered Species Act</i> (2007) if listed species and/or habitat is impacted</li> <li>• Confirmation Letter for the <i>Natural Heritage Assessment</i></li> </ul>
Ministry of Tourism, Culture and Sport ("MTCS")	<ul style="list-style-type: none"> <li>• Comment Letter for the Stage 1 and 2 Archaeological Assessments and the Cultural Heritage Assessment</li> </ul>
Quinte Conservation Authority ("QCA")	<ul style="list-style-type: none"> <li>• Permit for development in natural hazard lands under <i>Regulation 319/09</i> (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses)</li> </ul>
Ontario Energy Board ("OEB")	<ul style="list-style-type: none"> <li>• License to Generate under Section 57(c) of the <i>OEB Act</i></li> </ul>

Authority, Agency or Governing Body	Requirement
Township of Stone Mills and/or County of Lennox & Addington	<ul style="list-style-type: none"> <li>• Building Permit(s)</li> <li>• Transportation and public safety permits (e.g. entrance permit, road occupancy, moving permit, encroachment permit)</li> <li>• Road Use Agreement</li> <li>• Authorization, by way of Section 41 of the <i>Electricity Act</i>, for construction of collector/connection lines on public streets</li> </ul>
Industry Canada	<ul style="list-style-type: none"> <li>• Communication Frequency License</li> </ul>
Transport Canada	<ul style="list-style-type: none"> <li>• Permit for water crossings under the <i>Navigation Protection Act</i></li> </ul>

## 5.0 Project Information

### 5.1 Nameplate Capacity and Classification

The Project is designed to generate 54 MW<sub>AC</sub> of electricity. According to Part II, Section 4 of *Ontario Regulation 359/09*, the proposed Project is a Class 3 Solar Facility. The characteristics of a Class 3 Solar Facility, as described in the regulation, are as follows:

- The location of solar photovoltaic collector panels and devices are at any location other than mounted on the roof or wall of a building
- The name plate capacity of the solar facility is greater than 10 kilowatts.

### 5.2 Land Ownership

Except in instances where municipal road rights-of-way are utilized, the Project Location will be comprised of land that is privately owned and will be leased to the Proponent (see **Figure 2**). Legal property descriptions for the parcels that will contain project components (e.g., panels, inverter stations, substation, and electrical collector lines) are listed below:

- Part Lot 2 Concession 4 Camden East as in LA177004; Township of Stone Mills
- Part Lot 3-4 Concession 4 Camden East as in LA179200; except part 1 & 2 29R5506 & part 1 & 2 29R6671; Stone Mills
- Part Lot 8 Concession 4 Camden East as in LA240829; Stone Mills
- Part Lot 9 Concession 4 Camden East as in LA192556; Stone Mills
- Part Lot 4 Concession 5 Camden East as in LA172608; Township of Stone Mills
- Part Lot 5 Concession 5 Camden East as in LA123218; Stone Mills
- Part Lot 8 Concession 5 Camden East as in LA118272; Stone Mills
- Part Lot 6 Concession 5 Camden East as in LA183629; Stone Mills
- Part Lot 7 Concession 5 Camden East as in LA183629; Stone Mills
- Part Lot 1 Concession 5 Sheffield part 1 to 4 29rR663; s/t S8028; Stone Mills
- Part Lot 13 Concession 8 Camden East as in LA271138; Stone Mills
- Part Lot 14 Concession 8 Camden East as in LA167805; Stone Mills
- Part Lot 13 Concession 8 Camden East as in LA245084; Stone Mills
- Part Lot 12 Concession 8 Camden East as in LA245084; Stone Mills
- Part Lot 13 Concession 8 Camden East as in CA19725 Lying N of County Rd # 14 EXCEPT Part 1 to 4 29R3238; s/t LA144026; Stone Mills
- Part Lot 14 Concession 8 Camden East as in LA232258, s/t Debts in LA221255; Stone Mills
- Part Lot 11-12 Concession 8 Camden East as in LA279988 N of 29R5575; Stone Mills

### 5.3 Energy Sources

The primary source of energy that will be used to generate electricity will be the kinetic solar energy of moving photons exciting electrons within the solar photovoltaic (“PV”) panels. This will create direct current (“DC”) electricity, which is converted to AC electricity by inverters.

### 5.4 Project Components

PV panels will be the technology used to convert solar energy into electricity. With exposure to sunlight, the solar modules convert solar radiation into direct current (“DC”) electricity through a PV process. The PV process occurs when the energy from the sunlight is transferred to semiconductors contained in the modules. DC electricity generated from the PV panels will be collected and converted into AC electricity by inverters, which will be contained in multiple inverter stations. An inverter station is comprised of multiple components, including inverters and a medium-voltage (“MV”) transformer.

The AC energy output from the inverter stations will be transmitted via underground/overhead cables and connected to the substation. At the substation, the voltage will be stepped up to 230 kV and connected to existing H23B transmission circuit. A control building will also be present at the substation, containing communications and SCADA equipment.

Descriptions about the Project components, both temporary and permanent, that will be used to construct, operate, maintain and decommission the solar energy facility are provided below. For more detailed information, refer to the *Construction Plan Report* and *Design and Operations Report*.

#### 5.4.1 Operational Flexibility

A detailed Project design phase will be undertaken prior to the start of construction, which may result in some modifications to the information presented in the REA reports. These modifications include, but are not limited to, general adjustments to the site plan that result in a decrease in the Project's footprint (within the current boundary), and/or a decrease in the number of Project components or infrastructure (including transformers, inverter stations, PV panels, PV racking, etc.). Adjustments to the location of Project components may also occur within the Project Location boundary. Where specific equipment is proposed, alternate equipment may be utilized so long as it is equivalent in nature and does not result in any additional negative effects.

Regarding sound emitting components, provisions for operational flexibility are incorporated by constraining such equipment within an area of placement (polygon) rather than at a fixed point. The *Noise Study Report* demonstrates that the sound emitting equipment can be located anywhere within these polygons and still achieve the required predicted sound level limits at nearby receptors. Please see the *Noise Study Report* for additional details.

In all cases where an operational or technical change is necessary, the Project will remain within the Project Location boundary as shown on **Figure 2**, and commitments made in the various technical reports adhered to. This includes observing the minimum setback distances between Project components and the nearest significant natural feature, water body, and/or other feature where described and ensuring any proposed mitigation measures remain effective at avoiding or minimizing impacts.



During operations, routine modifications to the solar facility may be implemented (e.g., resurfacing of ingress/egress points and/or access roads, repairs to fencing, electrical maintenance, etc.) provided their effects are environmentally insignificant and do not exceed the boundaries of the constructed Project.

Four Connection Line route options have been assessed and presented in the REA reports (Preferred Route, Bid Route, Alternate 1 and Alternate 2). These are shown in Figure 3 of the *Design and Operations Report*. All four potential routes have been assessed as per REA requirements. Ultimately, only one route will be constructed and it will be chosen based on input from stakeholders and regulatory agencies as well as from findings from engineering studies. Residents will be notified once the final route has been selected.

The classification (Class 3 Solar Facility) and nameplate capacity (54 MW<sub>AC</sub>) of the Project are not subject to change.

#### 5.4.2 PV Panels and Mounting System

Approximately 190,000 to 290,000 solar PV panels of 340 (or higher) watts (DC) each will be installed for the Project. It is anticipated that the following PV panels, or equivalent, may be used: Hanwha Q Cells Q.PLUS L-G4.2. 340 W. However, this may be subject to change until a final decision on the module supplier is made. Should a higher output (Watt) panel be chosen, it will likely result in a reduction in the overall number of panels needed and a corresponding reduction in racking system components. It will not result in additional impacts such as an increase to the Project Location footprint or increased noise output.

The PV panels will be aligned in rows to be spaced approximately 5 to 12 m apart and will be mounted on racking structures. It is anticipated that the racking structures will be affixed to the ground by driven piles or helical ground screws. However, the final racking foundation design will be determined as part of detailed design prior to the start of construction. Further details can be found in the *Construction Plan Report*.

The racking structures either will be in a fixed southward-facing position or will be a tracking system that moves according to the direction of the sun's rays. Further details on the racking and supporting structures are provided in the *Design and Operations Report*.

#### 5.4.3 Inverter Stations and Equipment

PV panels create DC electricity, which is then fed through combiner and recombiner boxes to the inverter stations where it is converted to AC electricity. An inverter station houses multiple components, including inverters, and a medium voltage ("MV") transformer. The design and number of inverter stations to be used will be determined based on PV panel selection and electrical design. Up to 34 inverter stations will be required for the Project. Additional details will be provided in the *Design and Operations Report*. The following inverter type, or equivalent, is anticipated to be used in the final design: SMA Sunny Central SC 2200. Specifications for the proposed inverters can be found in the *Noise Study Report*.

#### 5.4.4 Electrical Collector System

The AC electrical energy output from the inverter stations will be collected via underground and/or above ground collector lines before being transmitted via the connection line to the substation. Where above ground, the collector lines will be mounted on poles. The electrical collector system will feed the generated power into the Project connection line. The exact locations of lines and pole locations for the electrical collector system will be determined during detailed design; however, they will all be within the Project Location boundary as shown on **Figure 2**.

#### 5.4.5 Connection Line

The connection line will transmit the generated energy from the PV panels, inverter stations and collector line system to the substation. The connection line will likely consist of three 3-phase circuits mounted either on poles or below ground (where necessary). Poles are anticipated to be between 65 and 80 feet tall and be equipped with mounting structures and electrical insulators and ancillary equipment such as grounding wire, communications cables, and others as necessary. Above ground poles will be supported by anchored guy wires where necessary. The preferred connection line route and pole locations have not yet been determined; however, it will be one of the four options shown in the *Design and Operations Report*. The preferred Connection Line route will be determined in consultation with stakeholders and regulatory agencies as well as based on findings from engineering studies. Residents will be notified once the final route has been selected.

#### 5.4.6 Substation and Other Equipment

The connection line voltage will be stepped up to the transmission grid voltage at the Project substation, to be located within leased lands on private property northeast of the intersection of Miller Road and Frizzell Road, adjacent to the HONI corridor (see **Figure 2**). The substation will be located adjacent to the existing 230kV transmission line (HONI designation H23B). The substation will be sized appropriately for a 54 MW<sub>AC</sub> solar facility.

#### 5.4.7 Access Roads

The Project will utilize access roads to allow vehicles and equipment to enter the PV panel array area from local municipal roads. The main entrances to the solar facility will be located off Hinch Road, Centreville Road, Rattie Road, and Miller Road. Permanent gravel access roads will be constructed to facilitate maintenance requirements during operations. Based on the final design for the project, the gravel access roads may also be constructed using a bonding substance. Geotextile fabric may be used to improve structural integrity and preserve the granular. If necessary, culverts will be installed beneath the access roads at locations where conveyance of surface water drainage is required. The overall design of the access roads will ensure that no adverse impacts to surface water flows will occur.

5.4.8	<b>Perimeter Fence and Lighting</b>
	<p>For the safety of the public and wildlife and to prevent vandalism, a perimeter fence will be installed. This will be a chain link fence of standard height that will be installed around the PV panel array area. The perimeter fence is a requirement of the Electrical Safety Authority (“ESA”) and will be built to their specifications. For security and maintenance purposes, lighting may be installed near the entrances of the solar facility and task-specific lights will be provided as necessary. They may also be motion-sensored to address potential lighting concerns.</p>
5.4.9	<b>Control Building, SCADA and Communication Tower</b>
	<p>An on-site Control Building will be constructed to house electrical controls, protection, and monitoring systems. In addition, a remote computer based system (called a supervisory control and data acquisition (SCADA) system) will be used to control and monitor the generating equipment, including such parameters as: active and reactive power output, terminal voltage, ramp rates, operational and safety alarms, and shutdowns. The building will also contain a battery backup system, fibre-optic communications cabling and external connections and a wireless communication tower.</p>
5.4.10	<b>On-Site Temporary Storage and Construction Areas</b>
	<p>During construction it will be necessary to construct temporary on-site storage areas for equipment and components. These areas form part of the Project Location and are included in the detailed Site Plan of the <i>Design and Operations Report</i>. Such areas will fall within the Project Location as shown in <b>Figure 2</b>.</p>
5.4.11	<b>Operations and Maintenance Building</b>
	<p>An Operations and Maintenance Building may be required for the Project. It is anticipated that this will either be a leased building in the town of Napanee, at another suitable nearby location, or located on-site. Temporary office buildings (e.g., portable trailers) will be required during construction. Any such buildings would be located within the Project Location boundary, on a property north of Hinch Road as shown on <b>Figure 2</b>.</p>
5.4.12	<b>Water Crossings</b>
	<p>Based on preliminary assessment of the study area, water crossings within the Project Location may be required for the connection line route, depending on which option is preferred. Additional details on water bodies within the Project Location are provided in <b>Section 6.3</b>.</p>
5.4.13	<b>Stormwater Management Installations</b>
	<p>Stormwater management measures such as swales, drainage ditches, retention ponds, rock check dams, etc. will be installed as needed to avoid impact to off-site drainage patterns by avoiding adverse changes to surface and groundwater flows. A Stormwater Management Plan will be developed prior to construction to identify the location and type of installations required.</p>



#### 5.4.14 Water Supply

If feasible and readily available, water for use in the Operations and Maintenance building toilets and sinks will be supplied from the municipal system. If not feasible, water would either be taken from an on-site well or be trucked in from a municipal supply using a local water hauler and stored in an above ground water tank within the building.

#### 5.4.15 Sewage Disposal

Should the Operations and Maintenance building be constructed within the Project Location, it would contain a washroom and kitchen facilities. Sewage from the washroom and kitchen facilities would be directed to a septic holding tank, designed in accordance with the Ontario Building Code and municipal building standards. A level gauge would be provided to monitor the need for emptying the tank by a licensed septic tank hauler and high level alarms with audible and visual warning would be provided to prevent overfilling.

#### 5.4.16 Other Equipment

Other ancillary equipment may include electrical switchgear, fibre optic communication cables (either buried or overhead), and security monitoring equipment, among others.

### 5.5 Project Activities

The following subsections outline Project activities during the construction, operations and decommissioning phases of the Project. The Project will not require the collection, transmission, treatment, storage, handling, processing or disposal of sewage (other than from the Operations and Maintenance building toilets), biogas, biomass or source separated organics or surface water. The operation of the facility will not discharge contaminants to the air. Some management of stormwater may be required.

#### 5.5.1 Construction

**Table 4** identifies activities associated with construction of the solar facility, which will take approximately 10 to 12 months and are anticipated to begin in late 2017. The activities will occur in the relative order in which they are presented below. Prior to the construction phase, the site will be surveyed and staked to delineate the boundaries for fencing, access roads, excavations and foundation locations. Areas to be avoided will be fenced or flagged. More information can be found in the *Construction Plan Report*.

Table 4: Construction Activities

Activity	Description
Surveying of Project Location	The site will be surveyed and staked to delineate the Project Location boundary. The survey will identify the location of underground utilities and/or infrastructure as well as the location of Project infrastructure. Significant or provincially significant environmental features and their applicable setbacks (e.g., water bodies, significant wildlife habitat, etc.) will also be clearly demarcated by the Proponent or their construction contractor. Areas to be avoided will be fenced and/or flagged, as appropriate.
Clearing, ground levelling and grading	Clearing activities will take place prior to the start of other major construction works and will consist of vegetation removal, grubbing and large surface rock removal. Following any clearing activities, and as necessary, the Project Location will be graded to facilitate construction activities.
Drainage and Erosion Control	An Erosion and Sediment Control ("ESC") plan will be implemented during construction to avoid sedimentation and other deleterious substances from being conveyed to the surrounding landscape. Routine inspections of the ESC installations will be conducted during construction to ensure they remain effective.
Installation of the perimeter fence and security lighting	For the safety of the public and wildlife, and for security purposes, a perimeter fence will be installed. This will be a chain link fence of standard height (approximately 1.8 m) that will be installed around the entire Project Location. The fencing is a requirement of the Electrical Safety Authority ("ESA") and will be built to required specifications. During construction, the site will be monitored by the supervising construction staff. For security and maintenance purposes, lights will be installed near the substation and site entrances to the facility and task-specific lights will be installed where necessary.
Construction of access roads and installation of temporary power	A series of internal gravel access roads will be needed for construction vehicles and equipment transport. They will also provide long-term access to the site for on-going maintenance and will allow a service vehicle to access each inverter station directly. During the construction period, it is anticipated that on-site electricity to power site trailers and communications will be obtained from the local distribution utility from nearby suitable distribution lines; failing this, temporary generators would be utilized.
Installation of water crossings	It is not anticipated that the design of the Project will require the installation of new water crossings for access roads. Underground installation may be required in some locations to cross water bodies for construction of the connection line. Should new or upgraded water crossings be required, permitting or approvals that may be required for work within or adjacent to water bodies will be obtained.

Activity	Description
Temporary storage, construction areas and installation of temporary facilities	Temporary laydown and construction staging areas will be located at existing facilities (i.e. warehouse and storage yard) in Napanee and located within the Project Location boundary. During the construction phase, any part of the Project Location may be used as temporary storage, which will be dependent upon how construction will be staged. Areas will be designated for the use of the construction office trailers, portable washrooms, first aid stations, vehicle parking, construction equipment parking, storage sheds, truck unloading/loading, waste disposal pick-up areas, and equipment and material laydown, among other uses.
Construction of foundations	Engineered foundations will be constructed for the solar PV racking systems, inverter stations, substation components, and the Operations & Maintenance building (if located within the Project Location). The final foundation selection(s) will occur during the Project's detailed design stage.
Installation of supports, racking and PV modules	Approximately 190,000 to 290,000 PV panels of 340 (or higher) watts (DC) will be installed for the Project. The PV panels will be mounted to a racking system that is aligned in rows approximately 5 to 12 m apart, and will use racking structures that are either fixed in place or track the movement of the sun.
Installation of collector line system and inverter stations	Collector lines within the generation portion of the site will either installed above ground on poles and/or placed in excavated trenches. It is anticipated that the majority of electrical collector lines installed in road rights-of-way will be located above ground on poles, anticipated to be between 60 and 70 feet tall. Poles will be equipped with mounting structures and electrical insulators and ancillary equipment such as grounding wire, communications cables, and others as necessary. Some poles will require guy wires and anchor installations. Collector lines on private property will be located underground unless technical constraints require overhead installations in some locations. Inverter stations will require support foundations. The type and depth of foundation will vary depending upon geotechnical characteristics of the subsurface area at each location.
Installation of connection line system	The connection line will be constructed to connect the Project to the project substation located adjacent to the existing HONI 230 kV line. Dependent on the preferred connection line route, it is anticipated that the connection line will be mostly overhead and installed on poles located within municipal road ROWs. Poles are anticipated to be between 65 and 80 feet tall and be equipped with mounting structures and electrical insulators and ancillary equipment such as grounding wire, communications cables, and others as necessary. Above ground poles will be supported by anchored guy wires where necessary. Some sections of the ROWs way may require clearing, while other sections may lend themselves to underground installation to avoid impacts to sensitive natural features.

Activity	Description
Communications & SCADA	A communications tower and SCADA system including fibre-optic cabling will be constructed to allow for remote communication and transfer of operation data with the Project. The SCADA system will be housed inside a Control building.
Substation	The Project substation will be located within leased lands on private property northeast of the intersection of Miller Road and Frizzell Road, adjacent to the HONI corridor.
Operations and Maintenance Building	An Operations and Maintenance building may be constructed within the Project Location. The exact location of this building, if required, will be determined during detailed design.
Remediation and Clean-up of Work Areas	After all major construction activities are completed, and the Project has been commissioned, work areas will be rehabilitated as needed. Construction-related waste and excess materials brought to the site will be removed and reused, recycled, or disposed of in accordance with provincial guidelines.
Site Landscaping and Vegetation	Site restoration and reclamation is planned for the Project Location where necessary, including along access roads. The restoration and reclamation strategy may include re-contouring of the land to suitable drainage patterns (in accordance with the Stormwater Management Plan), management and replacement of subsoil (if applicable), and topsoil and re-vegetation.
Testing and Commissioning	Prior to connection to the IESO transmission grid, components will be tested to ensure safe and proper operation.

Construction activities will be conducted by licensed contractors in accordance with required standards and codes and all activities will abide by applicable local laws. All construction-related activities will be conducted within the Project Location outlined in **Figure 2**. During construction, fuel, oils or grease may be stored on site. These materials will be stored in accordance with a Spills Prevention and Contingency Plan to be developed prior to the start of construction. Decisions on waste disposal or recycling during, and immediately after, construction will be made by the on-site contractor who will refer to the *Environmental Protection Act*.

### 5.5.2 Operation and Maintenance

**Table 5** outlines activities that are associated with the operation and maintenance of the solar facility. These activities will take place over the lifetime of the facility. More information can be found in the *Design and Operations Report*.

Overall, few activities are associated with the operational phase of the Project. The proposed solar energy facility can be monitored and managed remotely and minimal on-site activity is required for its daily operation.

An operations and maintenance manual will be prepared prior to the start of construction of the Project. Security, vegetation management, inspections and minor maintenance will be the only regular activities anticipated on site.

**Table 5: Operations and Maintenance Activities**

Activity	Description
Monitoring and meter calibrations	The solar facility will be monitored remotely twenty-four hours a day to ensure proper power output and to alert the operations staff to potential issues. Most issues can be remotely diagnosed so that staff can be dispatched to the solar facility to correct any problems.
Routine periodic maintenance and inspection of Project components	Regularly scheduled site visits will occur to inspect the solar facility to ensure all equipment is in proper working order. Activities that will occur during these visits may include data collection, regular maintenance (as described below) and any necessary minor repairs such as replacement of weathered electrical components. Facility security measures (fencing, locks) will also be checked. Transformers, inverters, PV panels, racking and above ground cabling will be inspected during scheduled visits.
Access road maintenance	Routine inspections of access roads may indicate the need for the addition of granular material and/or minor levelling and grading activities. The work is normally accomplished by small-scale equipment such as a skid steer.
Lighting	For security and maintenance purposes, lighting may be installed near the entrances of the solar facility and task-specific lights will be provided as necessary. These will be appropriately shielded or directed to avoid impacts to neighbours and will be inspected for burned/broken bulbs. Perimeter lighting is not anticipated.
Cleaning of PV panels	Rainfall is generally sufficient for cleaning the solar PV panels; however, depending on the quantity and frequency of rain at the Project Location, the modules may require periodic cleaning. If required, water trucks may be utilized to bring water to the site. Chemical detergents are not used for general cleaning of PV panels. During the winter, maintenance and operations crews may be dispatched to the site to remove snow from the PV panels using mechanical means (e.g., blowers affixed to mobile equipment).
Periodic landscape maintenance	Vegetation may be planted once construction activities are complete. It will be necessary to maintain the land in such a way that vegetation does not shade or in other ways impact the PV panels. Regular scheduled maintenance will also occur to manage weed growth as required. Other than in limited targeted applications (i.e., hand spraying of a commercially available herbicide such as RoundUp), it is not anticipated that herbicides will be used to manage vegetation. In most cases, vegetation will be managed by mechanical means. Herbicide applications will be reserved for rare cases where mechanical weed removal is either impractical or unsafe (e.g., presence of giant hogweed).

Activity	Description
Major maintenance	Unforeseen, large repairs are not anticipated. Should major maintenance or equipment replacement be required, it will be performed using existing roads and site access points.
Third party inspections and testing	Activities will be carried out as required by the local utility and other governing bodies in addition to any regularly scheduled inspections and testing.
Traffic	No major deliveries are anticipated for maintenance. Minimal vehicle traffic is associated with regular maintenance.
Drainage and erosion control	Water drainage from the Project Location will be managed as per a Stormwater Management Plan to be developed at the detailed design stage prior to the start of construction. This will be done with consideration to maintaining pre-construction drainage patterns and fulfilling the recommendations outlined in the <i>Natural Heritage Assessment</i> or <i>Water Reports</i> . Stormwater management features such as drainage ditches, culverts, rip rap, rock check dams, and retention ponds (if installed) will be regularly inspected. Minor clean up of accumulated sediment and debris removal may be required and will be accomplished using small-scale equipment e.g. skid-steer.
Waste	The operation of the system does not produce any appreciable waste. All debris as a result of maintenance or cleaning will be removed from the site immediately by the operator. An exception is sewage disposal from the washrooms and kitchen facilities (if an Operations and Maintenance building is located on site), which would be directed to a septic tank, holding tank, or held in portable toilets designed to building code requirements.

During the operations phase, no hazardous materials are anticipated to be stored on-site with the possible exception of oil within transformers and small quantities required for facility maintenance. Transformer oil will be adequately contained and accompanied by a Spills Prevention and Contingency Plan, which will be developed prior to the start of construction.

### 5.5.3 Decommissioning

Most of the materials used in a solar energy facility are reusable or recyclable, and some equipment may have manufacturer take-back and recycling requirements. Through the decommissioning phase of the Project, the site will be returned to a state similar to its pre-construction condition. Materials such as steel/aluminum from the racking system and copper from the electrical infrastructure will be removed and recycled. The PV panels will be removed and either returned through manufacturers' recycling protocols or refurbished and recycled where possible. Any remaining materials will be removed and disposed off-site at an appropriate location in accordance with governing regulations.

The following activities are associated with the decommissioning of the solar facility. These activities will take place at the end of the life of the Project. Decommissioning activities are expected to take between 10 to 12 months and will occur in the relative order in which they are presented below.

- Disconnection and removal of above-ground wiring; below-ground wiring will be cut and left in place

- Removal of PV panels, steel/aluminum structures and electrical equipment
- Removal of foundations and rack pilings and any maintenance buildings or other structures
- Removal of access roads
- Topsoil replacement as necessary
- Site grading and rehabilitation as necessary
- Removal of waste from the Project Location

The final decision on waste disposal or recycling will be contracted to the on-site contractor that will refer to the *Environmental Protection Act* before submitting a Generator Registration Report for each waste produced at the facility. More information can be found in the draft *Decommissioning Plan Report*.

## 6.0 Description of Environmental Effects

The following subsections provide a summary of potential effects that may result from the construction, installation, operation, use and retirement of the solar facility at the Project Location and within 300 m. Given the implementation of the mitigation and monitoring commitments in this REA application, no significant adverse effects as a result of the construction, operation, or decommissioning of the Project are expected.

### 6.1 Archaeology and Cultural Heritage

Archaeological Research Associates Ltd. ("ARA") was retained by the Proponent to complete an Archaeological Assessment and Cultural Heritage Assessment as required under *Ontario Regulation 359/09*.

#### 6.1.1 Archaeological Assessment

Stage 1 and 2 Archaeological Assessments ("AA") have been completed. The assessments were conducted in accordance with the *Ontario Heritage Act* and the Ministry of Tourism, Culture and Sport ("MTCS") current *Standards and Guidelines for Consultant Archaeologists*. During the summer of 2016, ARA assessed approximately 303 ha (750.29 ac) of land within the Construction Disturbance Area ("CDA") proposed for the Loyalist Solar Project. The Stage 1 AA included a desktop study and was conducted in April 2016. The Stage 1 AA identified potential for archaeological finds to occur. During the Stage 2 Assessment a total of 16 sites containing archaeological materials were identified. Of these locations, seven were identified as Pre-Contact findspots, eight were identified as Euro-Canadian findspots, and one was identified as a multi-component findspot. Further investigation was recommended for seven of the sites prior to development. Please see the *Stage 1 and 2 Archaeological Assessments* for more details. MTCS provided their acceptance of the Stage 1 and 2 Archaeological Assessment on December 6, 2016. The letter recommended that some site-specific Stage 3 Assessments be undertaken prior to construction for seven findspots.

#### 6.1.2 Cultural Heritage Assessment

A *Cultural Heritage Assessment* has been completed for the project in accordance with the MTCS's *Cultural Heritage Resources: An Information Bulletin for Projects Subject to Ontario Regulation 359/09 - Renewable Energy Approvals* (2013). The assessment included background research, consultation with appropriate agencies, and a windshield survey of potential cultural heritage resources within the study area. It is noted that the "Project Site Study Area" identified in the Cultural Heritage Assessment examined a larger area than will be associated with the Project Location. The assessment identified 87 Built Heritage Resources, and 5 Cultural Heritage Landscapes, which have cultural heritage value or interest. The study did not identify any protected properties within the study area. Potential direct and indirect impacts on the cultural heritage resources as a result of the project were evaluated, and measures recommended to avoid, eliminate or mitigate the impacts. Evaluation of impacts included a *Construction Vibration Zone of Influence Study* to assess the impacts of construction vibration on the resources.



Recommended mitigation measures include implementation of visual screening, avoidance of wood fencing, implementation of setbacks from construction activities to sensitive buildings, and implementation of BHR-specific mitigation measures (which may include salvaging demolished resources and investigation of any construction-related vibrations on resources). Please see the *Cultural Heritage Assessment* report for further details. The *Cultural Heritage Assessment* was approved by the MTCS in February 2017.

## 6.2 Natural Heritage Resources

The Proponent has undertaken a *Natural Heritage Assessment* (NHA) that consists of a Records Review, Site Investigation, Evaluation of Significance and Environmental Impact Study to identify natural features within the Project Location and surrounding 50 m. Under *Ontario Regulation 359/09*, the term “natural feature” refers to areas of natural and scientific interest (earth science and life science), wetlands, woodlands and wildlife habitat. The requirements for a NHA are outlined in Sections 24 to 28 of *Ontario Regulation 359/09*, with the development prohibitions detailed in Sections 37 and 38.

For the Project, based on the completed NHA records review and site investigation, the following natural features were identified within the Project Location and surrounding 50 m of the Project Location:

- Provincially Significant wetlands (4 units)
- Non-provincially significant wetland (1 unit)
- Unevaluated wetlands (53 units)
- Unevaluated woodlands (46 units)
- Candidate Significant Wildlife Habitat, including:
  - Waterfowl Stopover and Staging Areas (14 units)
  - Turtle Wintering Areas (1 unit)
  - Reptile Hibernaculum (16 units)
  - Colonially- Nesting Bird Breeding Habitat (Tree/ Shrub) (28 units)
  - Colonially- Nesting Bird Breeding Habitat (Ground) (16 units)
  - Alvar (21 units)
  - Old Growth Forest (7 units)
  - Waterfowl Nesting Area (7 units)
  - Bald Eagle & Osprey Nesting, Foraging and Perching Habitat (9 units)
  - Woodland Raptor Nesting Area (3 units)
  - Turtle Nesting Area (1 unit)
  - Amphibian Breeding Habitat (Wetlands) (1 unit)
  - Amphibian Breeding Habitats (Woodlands) (11 units)
  - Woodland Area- sensitive Bird Breeding Habitat (5 units)
  - Marsh Breeding Bird Habitat General (5 units)
  - Marsh Breeding Bird Habitat Green Heron (12 units)
  - Terrestrial Crayfish (1 unit)

- Common Nighthawk Habitat (13 units)
- Redheaded Woodpecker Habitat (7 units)
- Eastern Wood-Pewee Habitat (7 units)
- Wood Thrush Habitat (5 units)
- Large Yellow Pond Lily Habitat
- Juniper Hairstreak (28 units)
- Amphibian Movement Corridors (1 unit)
- Generalized Candidate Significant Wildlife Habitat, including:
  - Waterfowl Stopover and Staging Areas (Terrestrial and Aquatic)
  - Shorebird Migratory Stopover Areas
  - Turtle Wintering Areas
  - Waterfowl Nesting Area
  - Bald Eagle & Osprey Nesting, Foraging and Perching Habitat
  - Woodland Raptor Nesting
  - Seeps & Springs
  - Amphibian Breeding Habitats (Wetlands)
  - Amphibian Breeding Habitats (Woodlands)
  - Woodland Area- sensitive Bird Breeding Habitat
  - Marsh Breeding Bird Habitat (General)
  - Marsh Breeding Bird Habitat (Green Heron)
  - Common Nighthawk Habitat
  - Redheaded Woodpecker Habitat
  - Eastern Wood-Pewee Habitat

Following the site investigation work, the Project Location was refined to avoid sensitive natural features, where possible. Additional surveys were then completed to evaluate natural features for significance. Wildlife (birds, amphibians and reptiles) and vegetation surveys occurred over a period of 5.5 months in the spring, summer and fall of 2016. In total, over 475 hours were spent surveying the natural features associated with the Project. As a result, the following features were evaluated to be significant<sup>1</sup> and located either within the Project Location or within 50 m of the Project Location:

- Provincially Significant Wetlands (4 units)
- Assumed Provincially Significant Wetlands (32 units)
- Woodlands (18 units)
- Significant Rare Vegetation Communities (2 units; previously categorized under Alvars)
- Turtle Nesting Area (1 unit)
- Amphibian Breeding Habitats (Woodlands) (4 units)
- Woodland Area- sensitive Bird Breeding Habitat (3 units)

<sup>1</sup> Significant refers to provincially significant, significant or assumed provincially significant for the purposes of the REA reporting.

- Common Nighthawk Habitat (3 units)
- Redheaded Woodpecker Habitat (1 unit)
- Eastern Wood-Pewee Habitat (4 units)
- Wood Thrush Habitat (2 units)
- Large Yellow Pond Lily Habitat

In addition, the following natural features have been treated as significant. With the exception of the waterfowl stopover and staging areas, the following wildlife habitat is not able to be further surveyed due to access limitations (permission and/or health and safety concerns):

- Waterfowl Stopover and Staging Areas (Terrestrial; 10 units)
- Waterfowl Stopover and Staging Areas (Aquatic; 3 units)
- Turtle Wintering Area (1 unit)
- Reptile Hibernaculum (15 units)
- Colonially- Nesting Bird Breeding Habitat (Tree/ Shrub; 10 units)
- Amphibian Breeding Habitats (Woodlands; 2 units)
- Terrestrial Crayfish (1 unit)
- Carolina Whitlow Grass Habitat (1 unit)
- Juniper Hairstreak (25 units)

In consideration of the identified potential environmental effects, mitigation measures have been proposed to address these effects and maintain the ecological integrity and functionality of significant natural features. Details regarding proposed mitigation measures can be found in the *NHA Environmental Impact Study Report*.

The Project has been developed to retain the value of significant natural features identified and to mitigate negative effects that will occur. For the natural features deemed to be significant, the layout of the Project will allow for the persistence of natural features in the local landscape after this Project is constructed and operational.

For more details related to natural features, please refer to the NHA Reports.

### 6.2.1

### Species at Risk

Potential impacts to Species at Risk listed as *Threatened* or *Endangered* on the Species at Risk in Ontario list (*Ontario Regulation 230/08* under the *Ontario Endangered Species Act, 2007*) are being assessed as part of the approvals and permitting phase for the Loyalist Solar Project. Species at Risk assessments are reviewed separately from the REA process by the MNRF.

### 6.3 Water Bodies

A *Water Assessment Report* and *Water Body Report* were completed to identify water bodies within the Project Location and surrounding 120 m. Specific details related to the identification and mitigation of environmental effects are available in the *Water Body Report*.

Under *Ontario Regulation 359/09*, the definition of a water body includes lakes, permanent and intermittent streams and seepage areas, but does not include grassed waterways, temporary channels for surface drainage, rock chutes and spillways, roadside ditches that do not contain a permanent or intermittent stream, temporary ponded areas that are normally farmed, dugout ponds or artificial bodies of water that are intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and outdoor confinement areas.

As outlined in Sections 30 and 31 of *Ontario Regulation 359/09*, a records review and site investigation were undertaken to fulfill the requirements of the *Water Assessment Report*. The records review identified 17 potential water bodies mapped within the Project Location and surrounding 120 m, including three lakes and 14 potential permanent or intermittent streams. The site investigation confirmed the presence of one of the three lakes and 11 permanent/ intermittent streams. In addition, during the site investigation and additional two previously unidentified permanent streams were documented as well as five seepage areas. In total, there are 19 applicable water bodies associated with the Project Location and/or the lands within 120 m. The location and classification of the water bodies identified are discussed below:

- **Lakes**

- Water Body 1 was found during the site investigation to occur within the 120 m area of assessment from the Project Location. The water body was determined to be a small pond on a residential property at 894 Hinch Road, approximately 105 m south of the Project Location on Hinch Road. This feature was sufficiently naturalized and had little disturbance resulting from cattle pasturing, and will be treated as an applicable water body.

- **Permanent and/or Intermittent Streams**

- Mud Creek was found to intersect the Project Location and occurs within the 120 m area of assessment. The watercourse was found to be a permanent natural stream within an associated wetland complex.
- Tributary 2 to Mud Creek was found to intersect the Project Location. The watercourse was found to be a natural intermittent stream.
- Tributary 2.1 to Mud Creek was found to intersect the Project Location. The watercourse was observed to be a natural permanent stream.
- Salmon River was found to intersect the Project Location in three locations where connection line routes are proposed, and flows within 120 m of the Project Location at a fourth location. The Salmon River is defined as a natural permanent stream.
- Tributary 1 to the Salmon River was found to intersect the Project Location at a culvert location along a proposed connection line route along Teskey Road, approximately 45 m north of Bawn Road. The watercourse was found to be an intermittent stream.

- Tributary 2 to the Salmon River was found to intersect the Project Location along a proposed connection line route on Edges Road, approximately 70 m north of Marlin Road. The watercourse was found to be a natural permanent stream.
- Tributary 2.1 to the Salmon River was found to intersect the Project Location where there are proposed connection line routes in two locations, including where it crosses County Road 27 through a culvert approximately 670 m south of Marlin Road, and where it intersects the Project Location at County Road 27, approximately 210 m east of Teskey Road. The watercourse was found to have reaches that were dry and is therefore classified as an intermittent natural stream.
- Tributary 2.2 to the Salmon River was found to intersect the Project Location where there is a proposed connection line route on Edges Road approximately 630 m north of Marlin Road, and occur within the 120 m area of assessment from the Project Location. The watercourse was found to be an intermittent stream.
- Tributary 2.4 to the Salmon River falls within the 120 m area of assessment from a proposed connection line route northwest of the intersection of Edges Road and Marlin Road. The watercourse was found to be an intermittent stream.
- Tributary 3 to the Salmon River was found to intersect the Project Location where there is a proposed connection line route on Haggerty Road, approximately 17 m east of Miller Road. The watercourse was found to be a natural intermittent stream associated with a nearby wetland.
- Tributary 3.1 to the Salmon River was found to intersect the Project Location approximately 30 m northeast of the intersection of Miller Road and Haggerty Road West. The watercourse was found to be a permanent natural stream associated with a wetland community.
- Black Creek was found to intersect the Project Location at a box culvert where there is a proposed connection line route on Murphy Road, approximately 477 m north of County Road 14. The Creek was found to be a natural permanent stream.
- Pennell's Creek was found to intersect the Project Location where there is a proposed connection line route on Miller Road, south of Howes Road. The Creek was found to be a natural permanent stream.
- **Seepage Areas**
  - Seep 1 was estimated to occur within the 120 m area of assessment near the intersection of Tributary 1 to the Salmon River with the Project Location on Teskey.
  - Seep 2 was estimated to occur within the 120 m area of assessment near the intersection of Tributary 2.1 to the Salmon River with the Project Location on County Road 27.
  - Seep 3 was estimated to occur within the eastern 120 m area of assessment south of the intersection of Tributary 2 to the Salmon River with the Project Location on Edges Road.
  - Seep 4 was estimated to occur within 120 m of the Project at the edge of a fresh-moist mixed meadow community.
  - Seep 5 was estimated to occur within 120 m of the Project at the edge of a red cedar calcareous treed rock barren community.

As required by Section 39 of *Ontario Regulation 359/09*, PV panels and the substation transformer are prohibited from being constructed, installed or expanded in a Project Location within 30 m of the average annual high water mark of a water body. Other activities, such as perimeter fence construction and installation of collector and connection lines, are permitted if potential negative environmental effects are identified and appropriate mitigation measures are implemented (see Section 40 of *Ontario Regulation 359/09*). None of the Project activities are expected to have any physical or functional effect on a water body provided the appropriate mitigation measures are implemented and maintained. Mitigation measures proposed to minimize and/or eliminate negative environmental effects to water bodies within 120 m of the Project Location, and will be implemented during each Project phase. Details regarding mitigation measures can be found in the *Water Body Report*, *Construction Plan Report* and *Design and Operations Report*.

#### 6.4 Groundwater

Potential negative effects to groundwater are most likely to occur during the construction phase. The movement and storage of equipment, fuels, and construction waste have the potential to impact the groundwater table. Mitigation measures such as erosion and sediment control (e.g., silt fencing), the creation of a spill response plan, and spill containment will be implemented to minimize potential effects.

A Stormwater Management (SWM) Plan will be developed prior to the start of construction which will identify how grading and water flow management features will be installed to ensure that the Project does not result in a net change of water flow to adjacent properties and natural features. The SWM plan will be informed by a hydrogeological assessment which identifies current surface and groundwater flows associated with the Project Location. The hydrogeological study results indicate that the Project will not affect water quality or quantity into any residential well or effect water quality or quantity discharging to adjacent Mud Creek or Hinch Swamp. The SWM plan will also incorporate recommended mitigation measures from the *Natural Heritage Assessment* and *Water Body Report*, as applicable.

#### 6.5 Air, Odour and Dust

Once operational, regular operation of the solar facility will not create dust, odour or emissions to the air. During construction, increases in particulate matter (dust) may be experienced in the adjacent area, which are predominantly agricultural with some residential dwellings and an active aggregate pit. Additionally, there will be emissions from the diesel engines of construction machinery and equipment. These effects are typical of construction projects of this scale. The impacts from construction will be localized and temporary in nature and are very unlikely to be of a level capable of having a residual impact on regional air quality or climate change. No significant impacts to local air quality are expected. Mitigation measures to address construction-related air quality and noise are described in the *Construction Plan Report*.

## 6.6 Noise

During the construction period, construction activities will lead to elevated levels of noise in the area. Mitigation measures to minimize noise are described in the EEMP. Noise levels will be in accordance with Township of Stone Mills Bylaw 98-56 unless an exemption has been authorized. Once the solar facility has been constructed and is operational, the only noise generated will be from the inverter stations and substation. This equipment will be located to minimize noise impacts on receptors. As part of the REA application to the MOECC, a *Noise Study Report* has been developed that demonstrates compliance with regulated noise levels. Minimal noise (from vehicles, vegetation management, etc.) may be experienced during the operations phase at nearby receptors during times of periodic maintenance.

A standby generator will be located within the substation area to provide power in the case of periodic maintenance and for unexpected loss of local electrical service connection. Minor emissions will be released during generator operation. These emissions are not expected to have a significant negative impact to the air. The generator will comply with Section 7 of O.Reg. 359/09. More details are available in the *Design and Operations Report*.

Based on the results of the noise assessment, the Project will be in compliance with the required noise limits at all receptors (residences). For more information, please refer to the *Noise Study Report*.

## 6.7 Land Use and Resources

The proposed solar facility will be located primarily within lands currently zoned by the Township of Stone Mills as Rural. The Official Plan for the Township of Stone Mills designates the Project Location as rural, with lands within the surrounding 300 m designated as rural and some as provincially significant wetlands. None of the lands are designated or zoned as Prime Agricultural.

The upper-tier municipality (County of Lennox & Addington) designates the Project Location as rural area, with lands within 300 m designated as rural. Temporary loss of agricultural land will occur for the duration of the Project. Where appropriate, vegetation will be grown beneath and between the PV panel rows to stabilize soils. The Project Location will be returned to its original condition or similar after decommissioning. The lands are currently used for agricultural purposes.

## 6.8 Provincial and Local Infrastructure

Prior to the start of construction, the Proponent will work with the Township of Stone Mills and Lennox & Addington County to establish a Road Use Agreement. During construction, local roads may experience additional wear from heavy construction loads. Mitigation and/or repair of local roads will be outlined in the Road Use Agreement. Periodic traffic disruptions are possible along Frizzell Road, Miller Road, County Road 41, County Road 14, County Road 3, and County Road 27, Craigen Road, Hinch Road, Centreville Road, Rattie Road, Teskey Road, Murphy Road during the construction phase of the Project. A Traffic Management Plan that describes means to manage traffic disruptions and address safety concerns will be developed as part of the Road Use Agreement.

During construction, the municipal water supply may be accessed to provide water service to the on-site Operations & Maintenance building. Permission to connect to the water supply will be obtained from the municipality prior to construction.

## 6.9 Public Health and Safety

Potential impacts to public health and safety are minimal but include those generally related to construction. Noise, vibration and dust during construction can be attributed to human health impacts. The level of noise, vibration, and dust emissions expected during construction are anticipated to be low, localized and temporary in nature and mitigation measures will be implemented to address or eliminate the impacts.

Temporary and permanent fencing will prevent unauthorized access and increase public safety during the construction and operations phases. Appropriate signage, flagging and other safety measures will be taken to notify the public and ensure public safety. Applicable safety policies and procedures will be adhered to during the construction phase of the Project.

To reduce the risk of electrical or brush fires at the Project Location, fire safety equipment will be made available on site and stored in designated construction vehicles as appropriate. Smoking will be prohibited except in designated areas.

Emergency Response and Communications Plans ("ERCP") will also be prepared prior to construction and will outline the protocol to be followed in the event of an emergency at the Project. These plans will be developed in consultation with the local emergency services departments from the Township of Stone Mills. The Emergency Response Plan will provide key contact information for relevant responders, regulators, landowners and other stakeholders.

## 6.10 Areas Protected under Provincial Plans and Policies

The Project is not located in areas subject to Land Use Plans. Specifically, the Project does not lie within the Niagara Escarpment, Lake Simcoe Watershed, Oak Ridges Moraine or the Greenbelt. The Project supports the goals of the Province's *Green Energy and Green Economy Act*, 2009.



## 7.0 Benefits of the Project

The generation of power from solar energy will displace electricity that otherwise may have been generated by fossil fuel burning or non-renewable power plants. As a result, the energy generated will not contribute to climate change or emissions-related health impacts. There will also be a direct benefit to the local economy in terms of the number of construction jobs that will be created, and there will also be an economic gain to the local service sector (i.e., hotels, restaurants, etc.). The Project will also contribute to the municipal tax revenues. The Project supports the goals of the Province's *Green Energy and Green Economy Act*, 2009 and *Long-Term Energy Plan* (LTEP), 2013.