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SKYPOWER

GENERATING A BRIGHTER FUTURE



SKYPOWER LIMITED

Draft Project Description Report

Submitted by:



DILLON
CONSULTING

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1. Introduction

GoodLight LP proposes to develop a solar facility with a maximum name plate capacity of approximately 10 MW AC, located near Eldon, in the City of Kawartha Lakes, Ontario (**Figure 1**). The renewable energy facility will be known as GoodLight and will be rated as a Class 3 Solar Facility. GoodLight LP has received a contract from the Ontario Power Authority (OPA) for the sale of electricity generated by this renewable facility through the province's Feed-in-Tariff (FIT) program (enabled by the *Green Energy and Green Economy Act*). The project will require a Renewable Energy Approval (REA) as per *Ontario Regulation 359/09* under Part V.0.1 of the *Ontario Environmental Protection Act*.

This draft *Project Description Report* (PDR) provides an overview of the proposed project including location, components, activities and potential negative environmental effects. The draft PDR will be posted on the project website and is being submitted to the Ministry of Environment (MOE) as required under the REA process. It is also being made available for public viewing via municipalities.

2. The Proponent

SkyPower Limited is coordinating and managing the approvals process for GoodLight LP. Company activities include developing, managing, financing and owning renewable energy facilities. In the course of developing renewable energy projects, GoodLight LP complies with environmental approval requirements and obtains regulatory approvals that vary depending on the jurisdiction, project capacity and site location. In addition, GoodLight LP and SkyPower Limited are building long-term relationships with the communities that host their projects.

Contact information for the proponent is as follows:

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Prime Contact:	<u>Carmine Marando</u>
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Dillon Consulting Limited (Dillon) is the consultant responsible for the preparation of REA-related reports for GoodLight. The contact at Dillon is:

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3. Project Location

The proposed Class 3 Solar Facility consists of two properties located at 1175 and 2002 Sandringham Road, approximately 1 km from the community of Eldon. **Figure 1** shows the general location of the project in Ontario. The project location covers part of Lot 20, Concession 5 and part of Lot 20, Concession 6 of the City of Kawartha Lakes and consists of 51.14 hectares of privately owned land, with geographic coordinates (centroids) as follows:

- Latitude: 44° 30' 39.92" N
- Longitude: 78° 59' 23.47" W

“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”. While facility components making up the project location have been identified, their exact location within the marked property boundary has yet to be determined. Thus **Figure 2** shows the project location as the outer boundary (typically defined by the perimeter fence) within which all project components will be located. Updated maps will be provided in subsequent versions of the PDR and more detailed site plan layouts will be provided in the draft *Design and Operations Report* at a future date. **Figure 2** also identifies natural features and potential water bodies (based on the *Records Review* and site investigation) within 300 meters of the project location.



Figure 1: General Location of GoodLight in Ontario



GoodLight
Figure 2: Project Location
and Natural Features

Legend

- Site Entrance
- 5 m Contours
- Potential Water Body
- Local Roads
- Project Location
- 300 m from Project Location
- Lots/Concessions
- Rural *
- Provincially Significant Wetlands
- Non - Provincially Significant Wetland
- Unevaluated Wetlands
- Woodlands
- Eldon Site (Verulam Formation) Earth Science Area of Natural and Scientific Interest
- Carden Plain (QND040) Important Bird Area
- Candidate Open Country Bird Breeding Habitat
- Deer Yard Wintering Area

* Municipally Zoned



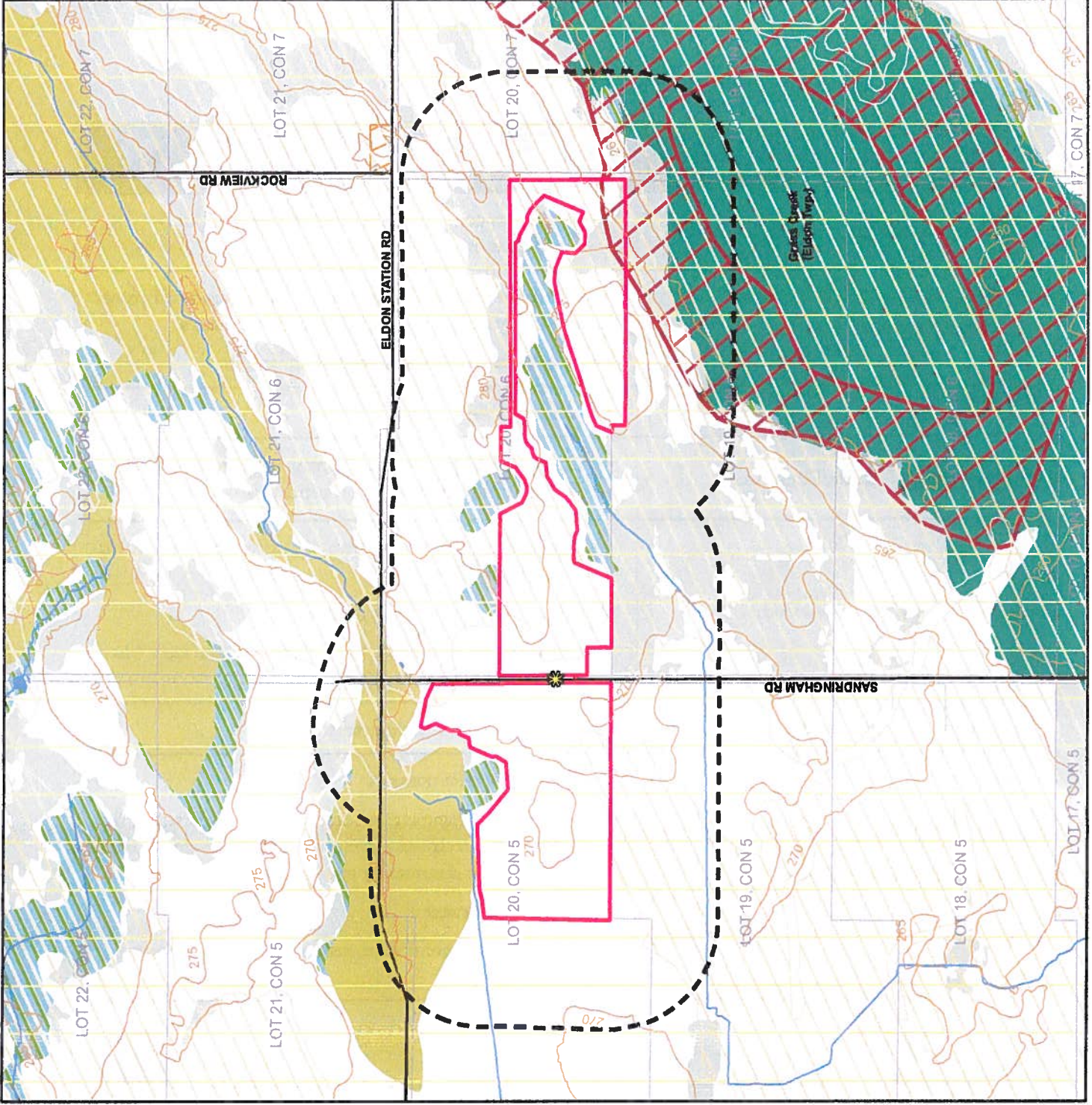
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 Date Modified: 11/28/11
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Figure 2: GoodLight Project Location PDF.mxd



4. Authorizations Required

Table 1 provides a list of authorizations (applicable permits, agreements, licenses, approvals and confirmation letters) that GoodLight LP expects may be required in addition to the Renewable Energy Approval. These will be obtained prior to construction of the proposed solar facility if required. It is not anticipated that the project will require a federal environmental assessment. This list will be updated in subsequent versions of the PDR.

Table 1: Potential Authorizations for the Project

Authority, Agency or Governing Body	Potential Authorization (as required)
Electrical Safety Authority	<ul style="list-style-type: none"> • Safety Inspection and Electricity Safety Code Certification
Hydro One Networks Inc.	<ul style="list-style-type: none"> • Customer Impact Assessment -- Integration of project within Hydro One and effects on customers • Construction Cost Recovery Agreement
Landowners	<ul style="list-style-type: none"> • Lease Agreements
Ministry of Natural Resources	<ul style="list-style-type: none"> • Endangered Species Act Permit (if designated species habitat is impacted – to be confirmed)
Ministry of Transportation	<ul style="list-style-type: none"> • Compliance with Highway Traffic Act and Road Safety Regulations • Road User Safety Policy Permit • Change of Access and Heavy/Oversize Load Transportation Permit(s)
Ontario Energy Board	<ul style="list-style-type: none"> • License to generate electricity
Ontario Power Authority	<ul style="list-style-type: none"> • Feed-In-Tariff contract • Connection Impact Assessment (to distribution line) or Customer Impact Assessment and System Impact Assessment if connecting to transmission system. • Notice to Proceed • Domestic Content Plan, security deposits, metering plan, etc.

Authority, Agency or Governing Body	Potential Authorization (as required)
City of Kawartha Lakes	<ul style="list-style-type: none"> • Building Permit(s) • Road User Agreement • Drainage Assessment • Entrance and signage permits

5. Project Information

5.1 Nameplate Capacity and Classification

GoodLight is designed to generate a maximum of 10 MW AC 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 (PV) collector panels and devices are at any location other than mounted on the roof or wall of a building; and
- the name plate capacity of the solar facility is greater than 12 kilowatts.

5.2 Land Ownership

The land is privately owned and will be leased to the proponent, GoodLight LP. The legal description for the property is: E1/2 Lot 20 Concession 5 Eldon as referenced by plan 57R7513; Kawartha Lakes and S1/2 Lot 20 Concession 6 Eldon as referenced by plan 57R6099; City of Kawartha Lakes.

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, which will be converted to electrons by the solar PV cells. This will create direct current (DC) electricity.

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 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 panels will be collected and converted into alternating current (AC) electricity by inverters. From the inverters, the electricity will be metered and transferred into the local distribution system for regular use after step-up transformers raise the voltage to appropriate distribution levels.

Details 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. Updated information and further detail will be available at a later date. The location of the components has yet to be determined but will be within the outer project boundary as shown in Figure 2.

5.4.1 Solar Modules and Mounting System

Approximately 50,000 - 100,000 PV panels of between 60 - 300 watts each will be installed for GoodLight, depending on the final selection of panel type and manufacturer subject to Ontario content requirements. These modules are heavy-duty and designed to withstand the harsh Canadian weather. The panels will be aligned in rows approximately 4 - 10 meters apart and will be mounted on fixed racking systems which will be attached to galvanized steel support structures. Details on the modules, mounting systems and support structures are not yet available but will be provided in subsequent versions of this report and in the *Design and Operations Report* as the project progresses. The type of foundation will be determined based on geotechnical studies but is likely to be driven or screw piles.

5.4.2 Inverters and Electrical Collector System

DC electricity generated from the panels will be transmitted through underground wires connected to combiner boxes where a number of incoming wires from the racks will be combined into a single outgoing cable. From the combiner box, the DC current will be transmitted below ground to one of ten inverter stations which will convert the DC electricity into AC electricity suitable for distribution to the local grid. Each inverter station contains two 500 kW inverters. The number of inverters used may vary based on electrical engineering and interconnection requirements. Updated information and further detail will be available at a later date.

5.4.3 Transformers

Step-up transformers located in the inverter stations will increase the voltage of the electricity collected which will then be distributed below ground to a main step-up transformer located within

a switch house. A 10 MVA pad mount transformer will then increase the voltage further for connection to the Hydro One transmission grid. The exact location of the transformers is unknown at this time but will be within the outer project boundary as shown in **Figure 2**.

5.4.4 Access Roads

The site will be accessed from Sandringham Road. Internal on-site granular access roads will be developed. The location of the access roads and their nature (permanent or temporary) has yet to be determined. Row to row rack spacing will be large enough such that service vehicles can access modules and wiring for maintenance. A central on-site road will allow a service vehicle to laterally access each inverter station directly.

5.4.5 Perimeter Fence and Communications Tower

For the safety of the public and to prevent vandalism, a perimeter fence will be installed. This will be a chain link fence as required by the Electrical Safety Authority around the perimeter of the project location with gated entrances. A communications tower, approximately 25 meters in height will be constructed as stipulated by Hydro One.

5.4.6 Temporary Storage and Construction Areas

During construction it will be necessary to designate/construct temporary storage/laydown areas for equipment and components as well as parking spaces for facility workers. These areas form part of the project location and will be included in the detailed Site Plan of the *Design and Operations Report*. Any such areas will fall within the outer boundary of the project location as shown in **Figure 2**. It is likely that temporary office buildings (portable trailers) and portable sanitary facilities will be required during construction. Any such buildings would be located within the project location as shown on **Figure 2**. Once construction is completed these temporary structures and facilities will be removed.

5.4.7 Water Crossings

As shown in **Figure 2**, all mapped potential water bodies occur outside of the project location. As such, no water crossings are anticipated for this project and appropriate setbacks have been applied.

5.5 Project Activities

The following subsections outline project activities during the construction, operations and decommissioning phases. GoodLight will not require the collection, transmission, treatment, storage, handling, processing or disposal of sewage, biogas, biomass source separated organics or surface water. The facility will not discharge contaminants to the air. The facility will be designed and constructed so as to minimize potential negative impacts to stormwater runoff and drainage. Preventative measures such as the use of permeable materials for road bedding, the installation of PV modules above grade, and the preservation or replacement of native vegetation (where possible) will maintain existing stormwater runoff and drainage conditions at the site. Current conditions will be determined through topographic and hydrologic investigations that will take place prior to the start of construction.

5.5.1 Construction

The following activities associated with construction of the solar facility are not anticipated to take between 6 - 9 months and are scheduled to begin spring/summer 2013. They will occur in the relative order in which they are presented below. More information will be forthcoming in the draft *Construction Plan Report*. Pre-construction activities that are currently underway include: archaeological and cultural heritage assessments, topographic surveys, geotechnical studies, Phase 1 Environmental Site Assessments, soil studies, and stormwater studies.

Table 2: Construction Activities

Activity	Description
Clearing, ground levelling, compacting and grading	Trees and vegetation, based on the results of the <i>Natural Heritage Assessment</i> , will be selectively cleared. Minimal ground levelling and grading may be required to ensure proper drainage and to facilitate construction activities. Top soil will be temporarily stored for reuse.
Drainage and erosion control	Based on the results of the <i>Natural Heritage Assessment</i> and stormwater management plans temporary and/or permanent equipment to manage flow and protect natural features during construction/operation will be installed. Temporary erosion and sediment control measures will be installed.

Activity	Description
Installation of perimeter fences and security lighting	Temporary fencing to delineate the construction area, as well as a permanent chain-link perimeter fence will be installed. Lights will be installed near the entrance of the facility and task-specific lights will be provided as necessary.
Installation of water crossings	The design of GoodLight does not require a new water crossing and appropriate buffers have been applied to potential water bodies found within the project location.
Construction of access roads and installation of temporary power	Temporary and/or permanent gravel access roads will be constructed to facilitate installation and delivery of equipment as well as future maintenance requirements. Electricity required for temporary construction offices, lighting and other purposes will be arranged.
Delineation of temporary storage and construction areas and installation of temporary facilities	Equipment laydown and materials storage areas will be delineated with fencing or other materials. Temporary office buildings (trailers) will be constructed.
Construction of foundations	Foundations for the solar modules and support structures will be constructed. The type of foundation (concrete, steel piles) will depend on the results of geotechnical studies and the supplier selected and thus the construction methods may vary.
Installation of supports, racking and PV modules	Support structures and racking will be mounted on the foundations and solar panels will be attached.
Installation of wiring and inverters/transformers	Where underground wiring is used, trenching may occur. Inverters and transformers will be set up on foundations and wiring will be interconnected.
Remediation and clean-up of work areas	All construction-related waste will be removed from the project site (waste will be reused/recycled where applicable).
Site landscaping	Vegetation, suitable to native climate and type of solar panels/equipment (e.g., clover), will be planted.

All construction activities will be conducted by licensed contractors in accordance with required standards and codes and all activities will abide by local laws and requirements. All construction related activities will be conducted within the project location outlined in **Figure 2**. Testing and commissioning of the facility will occur over the last few weeks of construction. During construction, no hazardous materials, including fuel, oils or grease will be stored on-site, although equipment will require their use.

The only waste produced during the construction period will be typical construction wastes, including packaging from the solar modules and other equipment. It is not anticipated that any waste material will be stored on-site; therefore, a Certificate of Approval for waste under Part V of the *Environmental Protection Act* will not be required. Disposal of hazardous wastes will only be required in the case of accidental spills and will follow the procedures outlined in the *Spills Response Plan*. All construction wastes will be disposed of in accordance with applicable regulations, with an emphasis on maximizing reuse and recycling, where possible. Final decisions on any wastes requiring 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

The following activities are associated with the operation and maintenance of the solar facility. These activities will take place over the lifetime of the facility. More information will be forthcoming in the *Design and Operations Report*.

Table 3: Operations and Maintenance Activities

Activity	Description
Monitoring and meter calibrations	Ongoing remote monitoring will occur 24 hours a day. Meter calibrations will occur as needed.
Periodic maintenance and inspection of project components	Regular inspections for all project components will occur on a scheduled basis. Routine preventative maintenance and replacement of weathered electrical components will be conducted. Security visits will be conducted as needed.
Cleaning of panels	Cleaning of panels/equipment and snow clearing will be conducted as required.

Activity	Description
Major or additional maintenance	Maintenance will be completed as needed if equipment fails or is damaged and needs to be repaired or replaced.
Periodic landscape maintenance	Ground maintenance will take place (frequency to be determined) to ensure that weeds are contained and that the panels are not shaded.
Inspections and testing	Activities will be carried out as required by the local utility and other governing bodies.

GoodLight will operate year round and generate electricity during daylight hours only. The facility will be continuously monitored and managed remotely using an online system that will identify any system problems that may occur. Minimal on-site activity is required for its daily operation and there will be no permanent on-site employees. Security and minor maintenance are the only regular activities anticipated on-site.

The project will be scheduled for maintenance every 2 - 3 months. Typically, maintenance includes checking the structures and connections. It is anticipated that the PV panels will be washed only as required. Additional maintenance or service may be required if there are issues such as equipment damage or malfunction; however, this will not be a common occurrence. Site inspections for all project components will occur on a scheduled basis.

During the operation phase, no hazardous materials will be stored on-site with the exception of oil for transformers, which will be adequately contained and accompanied by a *Spills Response Plan*.

5.5.3 Decommissioning

Properly maintained PV solar panels have an expected lifespan of approximately thirty to fifty years, or more with equipment replacement and repowering. However, this report assumes the decommissioning process will begin at the end of the power purchase agreement with the Ontario Power Authority.

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 lands could be restored to their former condition or future anticipated land use. Materials such as steel from the racking 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 of off-site at an appropriate facility.

The following activities are associated with the decommissioning of the solar facility. Decommissioning activities are expected to take between 6 - 9 months and will occur in the relative order in which they are presented below:

- disconnection from the electricity grid and removal of all electrical equipment;
- dismantling and removal of PV modules, support structures;
- removal of all above ground electrical lines and poles;
- dismantling and removal of electrical and electronic devices including inverters and transformers;
- dismantling and removal of communication tower, lighting fixtures and their protective shelters;
- removal of wiring, as necessary;
- removal of foundations and any other structures;
- removal of access roads, as necessary;
- removal of all non-native materials, including soil, stone, concrete and asphalt;
- site grading and rehabilitation, as necessary;
- re-seeding, as necessary; and
- removal of all waste from the project location.

More information will be forthcoming in the *Decommissioning Plan Report*.

The final decision on waste disposal or recycling will be made by the on-site contractor that will refer to the *Environmental Protection Act* before submitting a Generator Registration Report for each type of waste produced at the facility. All removal of equipment will be done in accordance with the applicable regulations. After the decommissioning process is complete the project location could be returned to a state suitable to its original or future use. More information on decommissioning activities and potential negative effects will be provided in the draft *Decommissioning Plan Report*.

6. Potential Environmental Effects

The following subsections provide a summary of potential effects that may result from the construction, installation, operation, use and retirement of the renewable energy facility at the project location and within 300 metres. Negative effects will be evaluated for mitigation and monitoring requirements to minimize impact. Details on mitigation measures and monitoring will be provided in subsequent reports.

6.1 Cultural Heritage and Archaeological Resources

The project has the ability to negatively impact cultural heritage and archaeological resources through damage, loss or removal of the resource from its greater context. Stage 1 and 2 *Archaeological Assessments* (background study and property inspection) are being undertaken for GoodLight. The assessments are being conducted in accordance with the *Ontario Heritage Act* and using the Ministry of Tourism and Culture's *Standards and Guidelines for Consultant Archaeologists (2011)*. The Stage 2 work will confirm the need for additional archaeological investigations, which will be undertaken as necessary. A full *Cultural Heritage Assessment* will be completed for the project.

All assessments will be provided to the Ministry of Tourism and Culture for comment and to the public in the draft REA release. Information regarding potential effects and mitigation will be summarized in a subsequent version of this report.

6.2 Natural Heritage Resources

Based on the zoning for the City of Kawartha Lakes, the project location for GoodLight is zoned as Rural. The project location and surrounding 300 metres is primarily open pasture, wetlands and woodlands. The Ministry of Natural Resources (MNR) has evaluation records for two wetland complexes to the northwest and southeast of the project location. To the northwest, the non-provincially significant wetland (PSW) complex of Kirkfield South is mapped and to the southeast, the provincially significant Grass Creek PSW occurs in association with a Strata 2 (locally significant) deer wintering yard. Each of these wetlands occur in a separate watershed; additional wetlands identified but not mapped on **Figure 2** will be complexed in with these evaluated wetland features according to which watershed they are located in. The project location and surrounding 300 metres also fall within the Carden Plain Important Bird Area.

No Provincial Parks, Conservation Reserves, Life Science Areas of Natural and Scientific Interest (ANSI), Earth Science ANSI or Valleylands were identified within the project location or surrounding 300 metres.

Except for the MNR mapped deer winter yard, no known wildlife habitat has been historically identified within the project location. Wildlife habitat in association with woodlands, open pasture areas and wetlands may occur within 300 meters of the project location, particularly in association with the Kirkfield South non-PSW complex and the Grass Creek PSW. These natural features may provide habitat for Species of Conservation Concern. The applicability of wildlife habitat with respect to the proposed project will be investigated further during the *Natural Heritage Assessment* of the project location and adjacent lands.

Figure 2 identifies the known natural features within the project location and surrounding 300 metres. The evaluation of natural features on the site is ongoing and all potential environmental effects of the project will be reviewed after natural features are identified as significant or potentially significant. In general the, potential environmental effects to natural features could include: erosion, release of suspended sediments, changes to surface and groundwater flow, dieback of edge vegetation, fragmentation of habitat, obstacles/barriers to wildlife movement, light and noise and the potential release of contaminants such as oils, gasoline, grease and other materials. Appropriate mitigation and/or monitoring measures will be developed and outlined in future reports related to the *Natural Heritage Assessment*.

6.3 Water Bodies

A potential water body within 300 metres of the south-eastern boundary of the project location was identified during the *Water Assessment Records Review* (see **Figure 2**). Preliminary site walkabouts have determined that this mapped potential water body is likely a grassy swale and provides headwater drainage from a wetland area. It does not have a defined channel and therefore likely does not meet the definition of a water body under *Ontario Regulation 359/09*. Although it likely will not be included as a water body under the REA process, mitigation measures related to potential water bodies may still be proposed as water is conveyed from the site into areas of lower elevation. This feature will be evaluated for potential impacts in the same manner as the natural features mentioned above in **Section 6.2**. In addition, a potential water body mapped to the north of the western extent of the project location does have characteristics of an intermittent water body (i.e., defined channel). In general, the potential environmental effects to water bodies could include: erosion, release of suspended sediments, changes to surface and groundwater flow, and the potential release of contaminants such as oils, gasoline, grease and other materials. Appropriate mitigation and/or monitoring measures will be developed and outlined in future reports related to water bodies.

6.4 Air, Odour and Dust

Once operational, the renewable energy facility is not anticipated to create dust, odour or emissions to air except as a result of some maintenance activities. During construction, increases in particulate matter (dust) may be experienced in the adjacent area, which is predominantly agricultural. Additionally, there will be emissions from the diesel engines of construction machinery and equipment which will cause temporary negative impacts to local air quality. The impacts will be localized and temporary and will not have a significant impact on regional air quality or climate change. Appropriate air quality mitigation measures (such as keeping equipment properly maintained and watering roads to reduce dust, as required) will be implemented during construction and should keep these occurrences to a minimum.

6.5 Noise

During the construction period, which is expected to be 6 - 9 months, construction activities will lead to elevated levels of noise in the area. Efforts will be made to minimize this noise and the project will comply with applicable municipal noise standards and restrictions. Once the solar project has been constructed and is operational, the only noise generated will be from the inverters and transformers, and sound levels will be modeled to ensure that the dB level meets the regulated requirement. Minimal noise (vehicles, spray washing) could also be experienced by nearby receptors during times of periodic maintenance as required.

6.6 Land Use and Resources

The planned solar facility will occur primarily within lands zoned by the City of Kawartha Lakes as Rural. A portion of the project location lands are currently under active agricultural production of row crops and the solar farm will temporarily alter the land use and remove approximately 35 hectares from production. Mitigation measures will be undertaken to ensure there are no impacts to surrounding land uses, which are primarily rural with a few residential dwellings. The project location could be restored to its original condition after decommissioning.

The proposed facility is physically low-profile and would be non-obtrusive to the surrounding community. Visual impact studies will be conducted as necessary.

6.7 Provincial and Local Infrastructure

Periodic traffic disruptions may occur along Sandringham Road during the construction phase of the project. Connection of the solar facility with Hydro One's existing distribution line may result in

some temporary power outages of short duration to local customers. Connection to the provincial grid has been considered under the FIT program and no negative effects are anticipated during the operational phase of the project.

6.8 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 are the key causes of human health impacts. The level of noise, vibration, and dust emissions expected during construction will likely be small, localized and temporary in nature and mitigation measures will be implemented to address or minimize the impacts.

Temporary and permanent fencing will prevent unauthorized access and ensure public safety during the construction and operational 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.

An *Emergency Response and Communications Plan* will also be prepared in the event of an emergency on the site and will provide key contact information for relevant responders, regulators, landowners and other stakeholders. A copy of this plan will be provided in the *Design and Operations Report*.

6.9 Areas Protected under Provincial Plans and Policies

The project is not located in or adjacent to 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.

7. Benefits of the Project

The generation of power from solar energy will displace approximately 10 MW AC of 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. A further benefit is that local jobs will be created, especially during the construction phase. The project supports the goals of the Province's *Green Energy and Green Economy Act, 2009*.