

Injasuti Developments

## BEAVER CREEK SOLAR FARM

---

Municipality of Central Elgin, County of Elgin

CONSTRUCTION PLAN

AUGUST 2011

# TABLE OF CONTENTS

|     |  |    |
|-----|--|----|
| 1.  | <b>INTRODUCTION</b> .....  | 1  |
| 2.  | <b>PURPOSE</b> .....   | 2  |
| 2.1 | <b>PRINCIPLES</b> .....  | 2  |
| 2.2 | <b>Scope of the Management Plan</b> .....  | 2  |
| 3.  | <b>CONSTRUCTION</b> .....  | 3  |
| 3.1 | <b>Pre-Construction Studies</b> .....  | 3  |
|     | <b>3.1.1 Locator Studies</b> .....   | 3  |
|     | <b>3.1.2 Electrical Works, Distribution and Transmission Works – Studies</b> ..... | 3  |
|     | <b>3.1.3 Short Circuit Studies</b> .....   | 3  |
|     | <b>3.1.4 Electrical System Coordination Study</b> .....                            | 3  |
|     | <b>3.1.5 Grounding System Study</b> .....  | 3  |
| 3.2 | <b>PROCUREMENT</b> .....   | 4  |
| 3.3 | <b>PROJECT MANAGEMENT</b> .....  | 4  |
| 3.4 | <b>SITE CONSTRUCTION MANAGEMENT</b> .....  | 4  |
|     | <b>3.4.1 General</b> .....   | 4  |
|     | <b>3.4.2 Site Management Responsibilities</b> .....                                | 5  |
|     | <b>3.4.3 Subcontract Management</b> .....  | 6  |
|     | <b>3.4.4 Environmental Effects Management</b> .....                                | 6  |
| 3.5 | <b>PROJECT CONTROL</b> .....   | 7  |
|     | <b>3.5.1 Project Meetings</b> .....  | 7  |
| 4.  | <b>TRAFFIC MANAGEMENT</b> .....  | 8  |
| 4.1 | <b>Purpose</b> .....   | 8  |
| 4.2 | <b>Pre-Construction</b> .....  | 8  |
| 4.3 | <b>Construction</b> .....  | 8  |
| 6.  | <b>CONSTRUCTION ACTIVITIES</b> .....   | 9  |
| 6.1 | <b>Site Assessments</b> .....  | 10 |
| 6.2 | <b>Construction Site Office &amp; Construction Barrier</b> .....                   | 10 |
| 6.3 | <b>Clearing, Laying of Solar Mast Foundations</b> .....                            | 10 |
| 6.4 | <b>Perimeter Fence</b> .....   | 10 |
| 6.5 | <b>Panel Rack and Installation</b> .....   | 11 |
| 6.6 | <b>PV Panel Installation</b> .....   | 11 |
| 6.7 | <b>Trenching and Cabling Construction</b> .....                                    | 11 |
| 6.8 | <b>Micro-Inverter and Substation Construction</b> .....                            | 11 |

## TABLE OF CONTENTS

|       |   |           |
|-------|---|-----------|
| 6.9   | Wiring, Pole Construction and Grid Connection.....                            | 11        |
| 6.10  | Site Remediation, Re-seeding and Clean-up.....                                | 11        |
| 7.    | <b>NEGATIVE ENVIRONMENTAL EFFECTS &amp; PROPOSED MITIGATION MEASURES.....</b> | <b>12</b> |
| 7.1   | Potential Negative Effects – Surface and Groundwater.....                     | 12        |
| 7.1.1 | Potential Negative Effect.....  | 12        |
| 7.1.2 | Performance Objective.....  | 12        |
| 7.1.3 | Mitigation Strategy.....  | 12        |
| 7.1.4 | Monitoring Plan/ Contingency Measures.....                                    | 13        |
| 7.1.5 | Net Effect.....   | 13        |
| 7.1.6 | Commitments.....  | 13        |
| 7.2   | Potential Negative Effects – Land.....  | 13        |
| 7.2.1 | Potential Negative Effect.....  | 13        |
| 7.2.2 | Performance Objective.....  | 13        |
| 7.2.3 | Mitigation Strategy.....  | 13        |
| 7.2.4 | Net Effect.....   | 13        |
| 7.2.5 | Commitments.....  | 13        |
| 7.3   | Potential Negative Effects – Air and Noise.....                               | 14        |
| 7.3.1 | Potential Negative Effect.....  | 14        |
| 7.3.2 | Performance Objective.....  | 14        |
| 7.3.3 | Mitigation Strategy.....  | 14        |
| 7.3.4 | Net Effect.....   | 14        |
| 7.3.5 | Commitments.....  | 15        |
| 7.4   | Potential Negative Effects – Natural Environment.....                         | 15        |
| 7.4.1 | Potential Negative Effect.....  | 15        |
| 7.4.2 | Performance Objective.....  | 15        |
| 7.4.3 | Mitigation Strategy.....  | 15        |
| 7.4.4 | Net Effect.....   | 16        |
| 7.4.5 | Commitments.....  | 16        |
| 7.5   | Potential Negative Effects – Resources.....                                   | 16        |
| 7.5.1 | Potential Negative Effect.....  | 16        |
| 7.5.2 | Performance Objective.....  | 16        |
| 7.5.3 | Mitigation Strategy.....  | 17        |
| 7.5.4 | Net Effect.....   | 17        |
| 7.5.5 | Commitments.....  | 17        |
| 7.6   | Potential Negative Effects – Socio-Economic.....                              | 17        |
| 7.6.1 | Potential Negative Effect.....  | 17        |
| 7.6.2 | Performance Objective.....  | 17        |
| 7.6.3 | Mitigation Strategy.....  | 18        |
| 7.6.4 | Net Effect.....   | 18        |

## TABLE OF CONTENTS

|       |   |    |
|-------|---|----|
| 7.6.5 | Commitments .....                                       | 18 |
| 7.7   | Potential Negative Effects – Heritage and Culture ..... | 18 |
| 7.7.1 | Potential Negative Effect .....                         | 18 |
| 7.7.2 | Performance Objective .....                             | 19 |
| 7.7.3 | Mitigation Strategy .....                               | 19 |
| 7.7.4 | Net Effect .....  | 19 |
| 7.7.5 | Commitments .....                                       | 19 |
| 7.8   | Contingency Plan .....                                  | 19 |
| 8.    | EMERGENCY AND OPERATIONAL MANAGEMENT .....              | 19 |
| 8.1   | Emergency Management .....                              | 19 |
| 8.2   | Operations and Maintenance Training .....               | 20 |
| 8.3   | Operating and Maintenance Manuals .....                 | 20 |
| 9.    | DISPUTE RESOLUTION PROTOCOL .....                       | 21 |
| 9.1   | Purpose .....   | 21 |
| 9.2   | Complaint Resolution .....                              | 21 |
| 9.3   | Implementation .....                                    | 22 |

## 1. INTRODUCTION

The purpose of this management plan is to outline the methodology to be used by Injasuti Developments (Injasuti) in implementing construction activities during the life of the solar farm projects in the Municipality of Central Elgin. Injasuti is proposing to develop a Class 3 Solar Facility south of Fruit Ridge Line along Centennial Road at Part Lot 10, Concession 4, municipally known as 43921 Fruit Ridge Line.

The partners of Injasuti have made efforts to establish good relations with the local community, and plan to be a long term members of the community. During construction, operation and decommissioning of the project, the company's emphasis will always be on control and mitigation of solar farm effects on the local community and the environment.

The goal of Injasuti during all phases of the solar farm project will be:

- Safe work performance;
- On-schedule facility completion;
- Quality assurance (QA);
- Municipal cooperation; and
- Quality community relations.

## 2. PURPOSE

Circulation of this document will provide general information to neighbours, municipal staff and the general public regarding the solar farm project as well as outline implementation procedures and protocols. This will facilitate understanding of the construction, operation, maintenance and decommissioning of the solar farm. The plan will be accessible and available for review by any interested persons at the Municipality of Central Elgin office and posted on the project website.

### 2.1 PRINCIPLES

The operation and management protocols are based on the following principles:

1. Open communications between the operators and the neighbours, municipality;
2. Quick response to any complaints or questions;
3. Accessibility of operator;
4. Fair and reasonable mitigation action; and
5. Resolving neighbours' complaints and issues in a timely manner.

### 2.2 Scope of the Management Plan

The Management Plan includes the following specific areas:

1. Construction Management – This plan addresses the construction of the project and related electrical studies, construction surveys and project management to be completed before and during the installation of all above and below grade equipment.
2. Traffic Management – This plan addresses the routing of construction traffic, possible impact on roads and safe traffic management during construction.
3. Emergency and Operational Management – This portion of the Management Plan addresses training and safe operation of the solar farm facility for the operators and the general public.
4. Dispute Resolution Protocol – The protocol sets out commitments by the operator to quickly address complaints made by neighbours when solar farm is operational.

## 3. CONSTRUCTION

### 3.1 Pre-Construction Studies

#### 3.1.1 LOCATOR STUDIES

To identify and locate existing buried services. Locator studies will be carried out along the routing for underground high voltage (HV) collector lines, pole lines for the collector line and the HV transmission lines and the substation area.

#### 3.1.2 ELECTRICAL WORKS, DISTRIBUTION AND TRANSMISSION WORKS - STUDIES

The objective of the power systems study is to determine that the station equipment principal ratings and protective devices are within the acceptable design limits intended for safe operation of the solar farm.

#### 3.1.3 SHORT CIRCUIT STUDIES

The short circuit study will be undertaken to evaluate and determine the peak duty and maximum break duty fault currents on all of the photovoltaic solar panels switchgear and the interconnecting switchgear of the grid systems. The protection and switchgear fault clearance time will be estimated.

The following fault currents will be evaluated:

- Initial short circuit current;
- Peak fault current; and
- Break fault current.

The results of the short circuit studies will be presented in tables that will include circuit breaker, fuse and other equipment ratings that will be specified versus the calculated short circuit duties.

Injasuti will submit the study reports to the Local Distribution Company (LDC), to obtain the final connection approval.

#### 3.1.4 ELECTRICAL SYSTEM COORDINATION STUDY

A coordination study will be undertaken to select power fuse ratings, protective relay characteristics and settings, ratios and characteristics of the PTs and CTs. The results of this study will be presented both graphically as well as in a table listing that includes circuit identification, IEEE device number, CT and PT ratios, manufacturer, type, range of adjustment, and recommended setting. The coordination study will determine maximum and minimum load and maximum and minimum voltage conditions.

Injasuti will submit study reports to the local LDC, to obtain the necessary approvals.

#### 3.1.5 GROUNDING SYSTEM STUDY

Grounding system studies will be undertaken, utilizing information on soil resistivity that has been made available by the Owner or determined through testing. Grounding is required at all solar array transformer locations, the switching station, and all pole switching locations. It is also required for system neutrals at the pad mount / arrays, bonding of all non-current carrying metal parts to ground,

and the establishment of a low resistance ground system with respect to datum earth, step and touch potentials and lighting protection.

Injasuti will obtain necessary ESA approval for grounding system drawings and specifications.

The design and engineering activity will be managed by lead discipline engineers reporting to the Project Manager. Detailed engineering packages will be prepared for the procurement of engineered equipment from vendors and third party suppliers. Detailed engineering drawings and material take-off lists will be prepared for procuring bulk electrical materials and construction of the balance of plant.

The Project Manager will have overall responsibility for managing this phase of the project. Senior discipline engineers and the Project Manager will review and approve each of the vendors' packages, drawings, specifications and designs to ensure that the design of the project will meet the intended duty and will comply with specified requirements of the Owner.

## 3.2 PROCUREMENT

Injasuti's engineer will identify engineered equipment, including main power, transformer, pad mounted transformers, HV equipment and other long delivery materials. Injasuti will proceed with finalizing specifications and data sheets and the placing of an order to purchase equipment. Injasuti will facilitate procurement coordination, material management, inspection and expediting activities.

Injasuti will procure other bulk materials and non-engineered equipment.

## 3.3 PROJECT MANAGEMENT

Injasuti's Project Manager will be responsible for the successful completion of the solar farm project. The Project Manager will be supported on the Project by key design, procurement, project administration, planning/scheduling, construction management and supervision and other personnel assigned from affiliated companies, as required, to manage subcontractors and to self-perform work required to complete the Project.

## 3.4 SITE CONSTRUCTION MANAGEMENT

### 3.4.1 GENERAL

Injasuti's Construction Manager will monitor and review all aspects of the construction of the project to ensure that the work is undertaken safely in accordance with the requirements of the drawings and specifications and in accordance to the project programme. The Construction Manager will be responsible for all of Injasuti's site activities until the project close out. The Construction Manager will be assisted and supported by construction superintendents and civil and electrical personnel visiting from head office, commissioning and quality control, health and safety professionals.

The successful implementation of the construction work will depend upon the following components:

- Implementation of our Safety Management Plan;
- A comprehensive and realistic construction strategy;
- Experienced site organization and required labour resources;



- Management of the Injasuti Subcontractors; and
- Overall project coordination.

Injasuti will achieve successful implementation by:

- Early mobilization of construction resources and temporary facilities;
- Early approval for construction drawing release to support construction team;
- Timely erection equipment mobilization;
- Timely delivery of equipment & material to site; and
- Timely installation of all aspects of the Project.

#### 3.4.2 SITE MANAGEMENT RESPONSIBILITIES

Injasuti's Construction Manager and the team will:

- Maintain good safety and health programs and practices as well as good environment control programs as part of all work activities;
- Execute site construction, installation and testing of equipment to a high standard of quality;
- Act as an interface with Injasuti's Project Manager and operational staff, the subcontractors, third party inspection (TPI) and other organizations involved with the Project;
- Manage any environmental and safety issues during construction and commissioning;
- Assist the Commissioning Engineer and their team in conducting site tests, including pre-commissioning, plant start-up, commissioning and supervise the TPI as required;
- Organize and attend regular site co-ordination meetings, progress meetings and prepare minutes of meetings;
- Maintain on site, complete and proper records of the progress of the Project;
- Maintain accounts and records of the cost of the works;
- Maintenance of correct as-built drawings reflecting all changes and modifications;
- Training of Injasuti operations and maintenance personnel; and
- Construction completion, testing and commissioning of all balance of plant items.

### 3.4.3 SUBCONTRACT MANAGEMENT

Subcontract control will be conducted to ensure that all subcontractors carry out their work at the site in accordance with the Project safety and quality requirements and complete their work in accordance with the Project schedule.

Subcontractors will be controlled, with emphasis on the following:

- Safety;
- Control of technical information;
- Fulfilling reporting requirements;
- Inspection and testing of construction material; and
- Non-conformance and quality control.

### 3.4.4 ENVIRONMENTAL EFFECTS MANAGEMENT

The Construction Manager will ensure that the project's construction phase will adhere to the recommendations outlined in the Environmental Impact Study as below:

#### 3.4.4.1 Pre-Construction Site Preparation

Prior to construction, the Construction Manager will ensure that:

- 1) A Biologist will walk the project location to search for any significant natural heritage features (if any are noted, appropriate setbacks and mitigation will be developed according to wildlife species noted in project natural heritage reports and studies);
- 2) The existing fence installed at the north project location boundary that will function as a construction barrier;
- 3) A dual function construction barrier/silt fence will be constructed 10 metres inside the project location on the west side;
- 4) A construction barrier will be installed at the project location on the south and east sides;
- 5) A construction barrier and construction barrier/silt fence will remain installed until the security fence is installed; and that
- 6) The silt fence at the west end will remain throughout construction.

#### 3.4.4.2 Construction

During construction, the Construction Manager will ensure that:

- 1) Should natural heritage features, such as turtle nests or turtles, be observed, the sighting will be reported by construction crew to the Construction Manager and that the Construction Manager will ensure that construction work will stay at least 5 metres distant from such nests until the nesting period is complete or the nest is scavenged (generally during month of June);
- 2) The silt fence is monitored weekly to ensure it is intact and functioning correctly;
- 3) Construction equipment will be stored within the fenced area, within the project location;
- 4) Careful fuelling methods are adhered to and undertaken within the project location; and that
- 5) Work should proceed from west to east, within the expected three month timeline (August – November 2011).

## 3.5 PROJECT CONTROL

The development of an achievable and comprehensive schedule is essential to the success of the Project. A project schedule will be prepared along with activity spreadsheets for PSP activities, which will form the basis of progress monitoring and act as principal indicator toward overall completion of the Project.

The subcontractor programmes will be reviewed to ensure that they accurately reflect the sequence and timing of Project activities. If any anomalies are identified, Injasuti will discuss these with the subcontractors to ensure that a detailed schedule is produced that is acceptable to all parties.

### 3.5.1 PROJECT MEETINGS

Design and construction coordination meetings will be convened as-required during the various phases of the project work. Injasuti's Project Manager and/or representative will plan and attend project meetings in order to review the project and to resolve any issues related to the project.

## 4. TRAFFIC MANAGEMENT

### 4.1 Purpose

The purpose of this section is to identify the safety measures, transport routes, monitoring and rehabilitation of municipal or county roads as needed over the duration of the project construction. The intent will be to maintain safe use of the roadways and minimize interference with the existing farm and passenger traffic around the solar farm site. No road impact is expected beyond what might normally occur from permitted agricultural or industrial operations in the vicinity of the project. The size of equipment used to deliver the materials, grade and construct the solar farm will not exceed the normal truck or trailer sizes permitted on the public roads. No long or oversize truck permits will be needed for construction.

### 4.2 Pre-Construction

The Project Manager will inform and consult with the Municipality regarding the expected use of abutting roads, any road improvements or changes needed for access points or drain crossings in accordance with established municipal criteria. The PM will identify the expected number of days of construction and hours of construction. It is expected the construction process will take three months with additional time related to site preparation and commissioning. The PM will advise the Municipality of any changes to transport routes or timing due to unexpected delays.

### 4.3 Construction

The solar farm Project Manager will manage traffic in accordance with all Provincial, County and municipal laws in the applicable jurisdiction. The PM will ensure that the appropriate signage is posted at the entrance and exit to the construction site from Centennial Road, warning of the activity. The PM will provide the necessary flag person to ensure safe entrance and exiting to the site as needed. Truck operators will be informed of related to the safe operation of vehicles in and around the construction site. The site will ensure safe turning movements to and from the site to avoid the need to back onto public roads. During construction all signage, signalling and related controls will be undertaken in accordance with the Manual of Uniform Traffic Control Devices, Ministry of Transportation Division 5, Temporary Conditions, and April, 1987.

The PM will ensure the road is maintained and cleaned as needed in accordance with Municipal standards. On a weekly basis, the PM will ensure that no construction debris or mud from the site is left on the public roadway. The PM will report any damage resulting from construction activity to the Municipality.

## 6. CONSTRUCTION ACTIVITIES

It is anticipated that the site construction activities for the Beaver Creek Solar Farm that will lead up to the operational phase will be within a 4 month period. Key activities during the construction phase will include: clearing; underground electrical cable trenching; foundation installation; materials transport and storage; and solar array assembly, erection and wiring. The following table provides the timeline of construction activities:

| <b>Beaver Creek Solar Construction Activity, Equipment &amp; Materials</b> |                 |              |               |   |  |
|--|-----------------|--------------|---------------|---|--|
| <b>Activity</b>  | <b>Duration</b> | <b>Start</b> | <b>Finish</b> | <b>Material Used</b>  | <b>Equipment</b>                           |
| Laydown Area   | 1 day           | 2/9/2011     | 2/9/2011      | topsoil   | bulldozer<br>scraper<br>dump truck         |
| Access Road  | 0               |              |               |   |  |
| PV Field   | 1 week          | 1/9/2011     | 12/10/2011    | Topsoil<br>Soil   |  |
| Array Foundation   | 4 weeks         | 1/9/2011     | 1/9/2011      | Steel Masts<br>Junction<br>Boxes<br>Concrete<br>foundations                     | backhoe<br>wheel loader<br>concrete trucks |
| Rack Installation  | 2 weeks         | 3/11/2011    | 14/12/2011    | steel and<br>Aluminum   | telehandler<br>RT crane                    |
| Panel Installation   | 2 weeks         | 3/11/2011    | 14/12/2011    | PV panels   | telehandler                                |
| Cable Trench /<br>Conduit<br>26.7 kV U/G cable<br>208/120V U/G<br>Cable    | 2 weeks         | 13/10/2011   | 2/11/2011     | Soil<br>Sand bedding<br>Cable   | Backhoe<br>pickup truck                    |
| UPS<br>Communication<br>Cabinet  | 1 week          | 3/11/2011    | 8/11/2011     | Topsoil<br>wiring<br>concrete<br>foundation                                     | pick up truck<br>service vehicle           |
| Mini-Substation<br>(Transformer)<br>Prep                                   | 4 weeks         | 3/11/2011    | 14/12/2011    | breakers<br>switches<br>control house<br>control wiring<br>cable<br>transformer | backhoe<br>pickup truck                    |
| Commissioning  | 2 weeks         | 15/12/2011   | 4/1/2011      | N/A   | pick up truck<br>service vehicles          |
| Revegetation   | 1 week          | 1/4/2011     | 7/4/2011      | hydroseeding  | pickup truck                               |

The construction of an access road is not required as a pre-existing access road was built by farmers who accessed the crop fields from the public sideroad adjacent to the project site. No water will be used during the construction phase and no special housing or food facilities will be provided during the construction phase as they are not required. The following sections identify the various activities that will occur during construction.

## 6.1 Site Assessments

A Biologist will walk the project location to search for any significant natural heritage features (if any are noted, appropriate setbacks and mitigation will be developed according to wildlife species noted in project natural heritage reports and studies.

## 6.2 Construction Site Office & Construction Barrier

A temporary office facility will be housed in a modular vehicle placed in the southwest corner of the project area (see site plan in the Design & Operations Report). The modular facility will be approximately 12 x 6 metres. Washroom facilities will be provided by temporary/moveable facilities. No water will be provided. The facility will serve as a base for the Construction Manager to monitor construction activities during the construction phase of the project. Once construction is completed, the modular facility will be removed.

The existing fence installed at the north project location boundary that will function as a construction barrier. A dual function construction barrier/silt fence will be constructed 10 metres inside the project location on the west side. A construction barrier will be installed at the project location on the south and east sides. A construction barrier and construction barrier/silt fence will remain installed until the security fence is installed; and that

The silt fence at the west end will remain throughout construction

## 6.3 Clearing, Laying of Solar Mast Foundations

The lands will be minimally cleared of vegetation to prepare for the placement of the solar panel and mast foundations. The proposed approach will be to minimally disturb the lands and to excavate the solar mast foundation areas only. The project proponent does not propose to grade the solar project area lands and thereby maintain the natural drainage patterns of the site.

Preparation of the solar mast foundations will involve the excavation of holes, the laying of gravel and the pouring of the concrete base. The masts will be installed in the centre of the above-ground foundations. These masts contain the electrical cables that send the produced electrical current to the inverters and further to the mini-substations (transformers). Any topsoil will be removed and stored on-site, and will be re-distributed upon completion of the construction phase.

Although no grading will occur, to prevent erosion, hay bales and a silt fence will be placed around the project perimeter downslope of the solar arrays.

## 6.4 Perimeter Fence

To prevent trespassing and vandalism, and to protect the public during construction activities, the project site is secured by a pre-existing perimeter fence that is built along the eastern property boundary line along Centennial Road. Access to the project site is secured by a locked gate. A natural vegetation buffer of several thousand native tree/shrub species has also been planted along the northern, eastern and southern boundaries of the project site by the Kettle Creek Conservation Authority.

Construction vehicles will access the site via the pre-existing access road and gate from Centennial Road.

## 6.5 Panel Rack and Installation

The installation of the Photovoltaic (PV) module racks will involve the use of heavy machinery and will occur during normal working hours. All rack components will be transported to the site by truck and placed in the designated laydown area.

## 6.6 PV Panel Installation

Once the racks have been installed, the PV panels will then be placed on the racks. This will complete the solar hardware installation and the use of heavier machinery.

## 6.7 Trenching and Cabling Construction

The solar panels' generated electrical currents must be 'transported' via cables. As such, a backhoe will excavate the trenches for the cabling required to link the solar panel module 208/120V cables to the transformers and the transformers to the 27.6 kV underground cable that links to the overhead wires that will connect to the 27.6 kV Hydro One Feeder 27M4 at the perimeter of the property. Minimal disturbance to the lands will occur and any topsoil will be removed and placed in storage. Seven arrays will be linked by these underground cables to one mini-substation as shown on the site plan in the Design and Operations report.

## 6.8 Micro-Inverter and Substation Construction

Because the PV panels produce direct current (DC) electricity, micro-inverters are required to convert this current to an alternative current (AC) which is suitable for electrical grid delivery. The micro-inverters are located on each PV panel and linked to each mini-substation (transformer) by the underground cables. These mini-substations increase the generated voltage from 208 volts to the 28 kV. The nine mini-substations (transformers) will ensure that the electrical flow is at the required voltage for the distribution line that runs adjacent to the project site.

## 6.9 Wiring, Pole Construction and Grid Connection

The mini-substations (transformers) will be linked by underground cable to the 27.6 kV cable linking all transformers. All cables will be contained within the project area and will be buried to a depth of approximately 1 metre. All cables are spooled and will be laid in trenches dug by backhoes. Any soils removed from the trench excavations will be refilled back into the trenches. Topsoil will be replaced upon completion of the construction phase.

Four holes will be excavated for the placement of the overhead poles and wires at the south end of the project area. A backhoe will be used to dig these holes, while a service vehicle will string the overhead wires between the poles. These overhead wires will link the underground 27.6 kV cable current to the overhead 27.6 kV Hydro One Line at the eastern perimeter of the project area.

## 6.10 Site Remediation, Re-seeding and Clean-up

Once construction activities are completed, all impacted areas will be remediated and returned to their pre-construction condition. Any topsoil that was removed will be spread amongst the array lands. All excess construction related materials will be removed. Pick-up trucks will be used to remove these materials by way of the access road to Centennial Road.

As the construction phase is likely to be completed in the midst of the winter months, re-seeding of the lands beneath the arrays will occur in the early spring. Native species will be planted or crops

should the landowners introduce livestock at that time. No heavy machinery will be required for the re-seeding of the lands.

## 7. NEGATIVE ENVIRONMENTAL EFFECTS & PROPOSED MITIGATION MEASURES

This section provides detailed descriptions of the identified environmental impacts expected during the construction phase of the project. Each description then expands upon how the proponent will mitigate and manage the environmental effect. Finally, a summary of expected net effects will be outlined based on any mitigation and management measures. The net effects will be described on the following basis consistent with Natural Resources Canada guidelines:

- Minimal – potential negative effects may be encountered during construction or decommissioning phase, but is otherwise not encountered during life of project;
- Low – potential negative effects may result in small deviations to the baseline data, but further commitments are not normally required;
- Medium – potential negative effects may result in significant but stable deviations to the baseline data, and further commitments through research, monitoring, should be considered;
- High – potential negative effects could create unsustainable impacts and are considered a concern. Further commitments should be considered to reduce effects.

Each subsection will conclude with a discussion of future monitoring and commitments, where deemed necessary, based on level of net effects.

### 7.1 Potential Negative Effects – Surface and Groundwater

#### 7.1.1 POTENTIAL NEGATIVE EFFECT

Stormwater runoff from solar facility is not expected to affect any natural waterbodies.

During the construction period of the solar farm there is a minimal chance of any negative environmental impacts to surface water or groundwater features.

#### 7.1.2 PERFORMANCE OBJECTIVE

That as a result of the solar project's construction phase, no significant change occurs to stormwater quality and quantity entering tributary. No external water will be brought to project area.

#### 7.1.3 MITIGATION STRATEGY

The project area adheres to natural feature setback requirements as shown on site plan in Design and Operations Report.

Natural rain will cleanse the solar panels rather than man-made cleaning products.

Maintenance of vegetative cover under solar panels as described in the facility design plan and construction plan.



#### 7.1.4 MONITORING PLAN/ CONTINGENCY MEASURES

Given that there are no expected impacts, no protocol is proposed for mitigation.

#### 7.1.5 NET EFFECT

The net effect of constructing the solar farms on surface and ground water features is *minimal*.

#### 7.1.6 COMMITMENTS

Hay bales and siltation fences will be installed at western and southwestern boundaries of project area that is downhill from solar panel arrays. The silt fence will be monitored weekly to ensure it is intact and functioning correctly.

## 7.2 Potential Negative Effects – Land

### 7.2.1 POTENTIAL NEGATIVE EFFECT

#### 7.2.1.1 Adjacent Land Uses

- The construction of solar panels to adjacent landowners will be a temporary annoyance due to construction personnel working.
- While the erection of solar panels may impact the ability of erecting solar panels on adjacent properties, there are no planned solar panels within the Study Area by other, unrelated proponents.

### 7.2.2 PERFORMANCE OBJECTIVE

To limit the construction impact during the installation process of the solar panels by ensuring normal business hours are adhered to.

### 7.2.3 MITIGATION STRATEGY

#### 7.2.3.1 Adjacent Land Uses

The issue of construction in the agricultural landscape will be mitigated by ensuring Construction Manager is on-site at all times and is available to adjacent landowners.

### 7.2.4 NET EFFECT

#### 7.2.4.1 Adjacent Land Uses

The net effect of the project during construction will be *minimal* from the standpoint that the project area is a remediated aggregate extraction area and the construction activity will be similar to farming of crops on the land.

### 7.2.5 COMMITMENTS

#### 7.2.5.1 Adjacent Land Uses

To ensure that communication opportunities are available to adjacent landowners during the construction phase and contact information will be posted on site. Construction equipment will be stored within the fenced area, within the project location

## 7.3 Potential Negative Effects – Air and Noise

### 7.3.1 POTENTIAL NEGATIVE EFFECT

#### 7.3.1.1 Air pollutants

There will be no toxic air pollutants created during the construction phase of the project.

#### 7.3.1.2 Greenhouse Gas Emissions

There will be no greenhouse gas emissions associated with the project during the construction phase of the project.

#### 7.3.1.3 Dust / Odour

There will be some dust or odour associated with the project during the construction phase of the project.

#### 7.3.1.4 Construction Noise

There will be construction noise during the construction phase of the project.

### 7.3.2 PERFORMANCE OBJECTIVE

That during construction phase of solar project, no air pollutants, nor greenhouse gas emissions will be emitted by construction of the solar panels. To minimize any dust and reduce construction noise by operating during normal business hours.

### 7.3.3 MITIGATION STRATEGY

#### 7.3.3.1 Air pollutants

None required during construction phase of project.

#### 7.3.3.2 Greenhouse Gas Emissions

None required during construction phase of project.

#### 7.3.3.3 Dust/Odour

The construction personnel will ensure that trucks carrying soils will be covered with tarps to reduce any dust from escaping.

#### 7.3.3.4 Construction Noise

The construction of the solar panels will be similar to farm operations and will be limited to daytime business hours.

### 7.3.4 NET EFFECT

#### 7.3.4.1 Air pollutants

*Minimal* during construction phase of project.

#### 7.3.4.2 Greenhouse Gas Emissions

*Minimal* during construction phase of project.

#### 7.3.4.3 Dust/Odour

*Minimal* during construction phase of project.

#### 7.3.4.4 Construction Noise

Low during construction phase of project.

#### 7.3.5 COMMITMENTS

##### 7.3.5.1 Air pollutants

None required relating to construction phase of project.

##### 7.3.5.2 Greenhouse Gas Emissions

None required relating to construction phase of project.

##### 7.3.5.3 Dust/Odour

Ensuring that any potential dust is controlled through use of appropriate materials (e.g. tarps on pickup truck beds) during any topsoil movement.

##### 7.3.5.4 Construction Noise

That the construction of the solar panel foundations and racks, and trench digging will occur during daylight business hours and that the Construction Manager will be on-site during all construction activities for communication purposes with adjacent landowners.

## 7.4 Potential Negative Effects – Natural Environment

#### 7.4.1 POTENTIAL NEGATIVE EFFECT

##### 7.4.1.1 Wildlife

The Natural Heritage Assessment Report noted that the white-breasted Nuthatch and Scarlet Tanager are sensitive to the available woodland habitat in the area. The Environmental Impact Study notes that turtles may nest in vicinity of the project location during month of June.

##### 7.4.1.2 Fish

Construction activities will have no impact to fish or fish habitat.

##### 7.4.1.3 Migratory Birds

Construction activities will have no impact to migratory birds or migratory bird habitat.

#### 7.4.2 PERFORMANCE OBJECTIVE

To ensure that construction personnel maintain work within the designated project area. Construction activities will have no effect on fish or bird habitats.

#### 7.4.3 MITIGATION STRATEGY

##### 7.4.3.1 Wildlife

To mitigate any potential impacts on wildlife habitat, the solar farm has been designed to locate all project components including panels, access roads, cabling and transformers outside of any woodlots or amphibian habitats located on or near the subject lands.

##### 7.4.3.2 Fish

None required during construction phase of project.

#### 7.4.3.3 Migratory Birds

None required during construction phase of project.

#### 7.4.4 NET EFFECT

##### 7.4.4.1 Wildlife

It is anticipated based on the recommended mitigation and impact management measures and subsequent solar farm design that the net effects to any faunal wildlife will be *minimal*.

##### 7.4.4.2 Fish

The expected net effects to fish or fish habitat as a result of the construction phase of the project are *minimal*.

##### 7.4.4.3 Migratory Birds

The expected net effects to migratory birds or migratory bird habitat as a result of the construction phase of the project are *minimal*.

#### 7.4.5 COMMITMENTS

##### 7.4.5.1 Wildlife

Prior to construction, a biologist will walk project location to search for any significant natural heritage features. If noted, appropriate setbacks and mitigation will be developed according to species noted. During re-seeding phase, if natural heritage features, such as turtle nests or turtles are observed, the sighting will be reported to project manager who will ensure that any workers will stay at least 5 metres distance from wildlife until nesting period is complete or nest is scavenged.

##### 7.4.5.2 Fish

None required during construction phase of project.

##### 7.4.5.3 Migratory Birds

None required during construction phase of project.

## 7.5 Potential Negative Effects – Resources

#### 7.5.1 POTENTIAL NEGATIVE EFFECT

##### 7.5.1.1 Prime Agricultural Lands

The project components will require approximately 6.5 ha of Canada Land Inventory Class 1 and 2 soils to be taken temporarily out of agricultural production during the construction phase of the project, although these lands were adjacent to a gravel extraction pit operation.

##### 7.5.1.2 Agricultural Production

The proponents will lose approximately 9% of their lands that are currently used for cash crop purposes, but will not lose significant land for small-scale livestock purposes.

#### 7.5.2 PERFORMANCE OBJECTIVE

To minimize disturbance of topsoil in project area to maintain agricultural land use post-construction.

### 7.5.3 MITIGATION STRATEGY

#### 7.5.3.1 Prime Agricultural Lands

The prime agricultural lands' topsoil that may be excavated, will be removed and stockpiled and will either be returned around solar arrays or will be used elsewhere on-site for agricultural improvements where possible.

#### 7.5.3.2 Agricultural Production

During the construction phase, agricultural production will be halted, although the planned construction phase is proposed for the fall and winter season when agricultural production has ceased. The solar farm lands are proposed to be used for livestock grazing during the operational phase of the project.

### 7.5.4 NET EFFECT

#### 7.5.4.1 Prime Agricultural Lands

The proposed mitigation measures will result in a net effect on prime agricultural lands which is *minimal*.

#### 7.5.4.2 Agricultural Production

The proposed mitigation measures will result in a net effect on agricultural production which is *minimal*.

### 7.5.5 COMMITMENTS

#### 7.5.5.1 Prime Agricultural Lands

The removal of topsoil and redistributing once construction has ended.

#### 7.5.5.2 Agricultural Production

That re-seeding will occur post-construction during growing season and agriculture production will proceed.

## 7.6 Potential Negative Effects – Socio-Economic

### 7.6.1 POTENTIAL NEGATIVE EFFECT

#### 7.6.1.1 Traffic

There will be limited traffic impacts during the construction phase of the project. Any such traffic between access roads and public rights-of-way will be sporadic in nature and typical of normal farming activities in the general area.

#### 7.6.1.2 Public health and Safety

Construction personnel will adhere to Provincial health and safety standards.

### 7.6.2 PERFORMANCE OBJECTIVE

To maintain public health and safety of construction personnel and the public through sound construction practices and monitoring activities.

### 7.6.3 MITIGATION STRATEGY

#### 7.6.3.1 Traffic

The size of equipment used to deliver the materials, grade and construct the solar farm will not exceed the normal truck or trailer sizes permitted on the public roads. No long or oversize truck permits will be needed for construction.

#### 7.6.3.2 Public Health and Safety

Construction Manager will ensure that all construction personnel adhere to Provincial Health and Safety Codes.

### 7.6.4 NET EFFECT

#### 7.6.4.1 Traffic

The impacts of traffic during the construction phase of the project on surrounding roads are typical of land use activities in the area and therefore considered to have *minimal* net effect.

#### 7.6.4.2 Public health and Safety

The net effects to human health caused by construction will be minimal as the impact management measures will be followed during construction.

### 7.6.5 COMMITMENTS

#### 7.6.5.1 Traffic

The solar farm Project Manager will manage traffic in accordance with all Provincial, County and municipal laws in the applicable jurisdiction. The PM will ensure that the appropriate signage is posted at the entrance and exit to the construction site from Centennial Road, warning of the activity. The PM will provide the necessary flag person to ensure safe entrance and exiting to the site as needed. Truck operators will be informed of related to the safe operation of vehicles in and around the construction site. The site will ensure safe turning movements to and from the site to avoid the need to back onto public roads. During construction all signage, signalling and related controls will be undertaken in accordance with the Manual of Uniform Traffic Control Devices, Ministry of Transportation Division 5, Temporary Conditions, and April, 1987.

The PM will ensure the road is maintained and cleaned as needed in accordance with Municipal standards. On a weekly basis, the PM will ensure that no construction debris or mud from the site is left on the public roadway. The PM will report any damage resulting from construction activity to the Municipality.

#### 7.6.5.2 Public health and Safety

The Emergency Response Protocol may contain measures to deal with any threats to public health as it relates strictly to the electrical components of the project.

## 7.7 Potential Negative Effects – Heritage and Culture

### 7.7.1 POTENTIAL NEGATIVE EFFECT

Impacts to archaeological resources will not be impacted during the construction phase of the project. Impacts to cultural heritage resources as a result of the solar farm construction are subjective, but could be considered negative based on visual impacts.

#### 7.7.2 PERFORMANCE OBJECTIVE

To ensure lands remain undisturbed at a sufficient depth to retain original subsurface conditions.

#### 7.7.3 MITIGATION STRATEGY

To ensure that trenching and foundation excavation processes are dug to appropriate depths and to widths required for cable and foundation needs. Should any archaeological materials be found, they will be documented and the Construction Manager will be notified. Should an archaeologist be required, they will be contacted for a site visit and assessment.

#### 7.7.4 NET EFFECT

The net effect to archaeological resources is considered *minimal* given the mitigation measures used to document and recover any potential materials during the construction phase of the project. The net effect to cultural heritage resources is considered *minimal* given the absence of such resources within the vicinity of the project areas.

#### 7.7.5 COMMITMENTS

To monitor the sub-surface lands for any significant archaeological materials and to document the found material and report any findings to Construction Manager.

### 7.8 Contingency Plan

During construction, unforeseen events may occur, such as unusual climactic conditions or construction-related incidents. Contingency planning for such a possibility will ensure that no negative environmental effects occur.

In the case of the unlikely situation wherein the applicable mitigation strategies outlined above and in associated studies/reports, fail to resolve negative environmental effects, the Beavercreek solar project owner and project contractor will ensure that construction crew personnel cease operations until repairs or mitigation measures can be implemented. Some negative environmental situations may require that staff undertake interim repairs until appropriate conditions prevail. As such, all staff will be informed and trained by project owner and/or contractor in implementing counteractive measures and will be notified as to the location of emergency materials' storage. Such materials will include: Silt fencing; fiber rolls; absorbent materials; shovels / rakes; containers; and other materials deemed appropriate by landowner, contractor or biologist to mitigate unforeseen on-site negative environmental incidents.

## 8. EMERGENCY AND OPERATIONAL MANAGEMENT

Under the direction of a commissioning representative, Injasuti will carry out tests at site, pre-commissioning tests and commissioning tests of all systems in the substation, collector system, overhead distribution lines and operations building and the photovoltaic solar panel equipment.

### 8.1 Emergency Management

Emergency management establishes sound safety practices in response to risks associated with injury to persons or damage/loss to property. There is no specialized training or equipment needed for local emergency response services associated with the solar farm. Solar farm equipment and infrastructure do not change the demand or scope of emergency response services because the materials and operation have the same risk associated with materials and equipment used on industrial sites elsewhere in the Municipality of Central Elgin. The local fire, police and ambulance

services are trained for emergency response to industrial sites in the Municipality and are therefore equipped and trained to respond to the solar farm projects.

Emergency response is provided through 911 calls for the Municipality of Central Elgin. In addition emergency contact phone numbers will be posted at the entrance to the solar farm and at the visitor/operations building located on the site. The on-site/on-call solar farm operator will be available 24 hours per day and 7 days per week all year, to provide emergency response assistance on behalf of the owner.

## 8.2 Operations and Maintenance Training

The training program is designed to provide basic understanding of the equipment and its associated auxiliary systems for the solar farm operator and staff. The training will consist of a combination of walk-downs during the erection of the equipment, review of operations and maintenance manuals and monitoring of the commissioning of the equipment. All training will be provided at the site.

The training program will cover the following:

- Commissioning of the systems;
- Operational features of the plant, including solar panels; and
- Maintenance aspects.

Injasuti operations personnel will witness and take part in the commissioning activity, as this becomes an integral part of on-the-job (OTJ) training. Commissioning will include all activities associated with start-up and energization so as to permit PSP commissioning by others. Injasuti will conduct and supervise the testing, and attend and witness the tests on completion to determine that the solar farm is safe, ready and complete. Injasuti will prepare the test results to determine that each solar panel park has been satisfactorily completed, has met its conditions of the contract and ready is for hand over to Injasuti.

It is anticipated that Injasuti's operations personnel will actively participate during the erection and commissioning phase of the project in order to have an OTJ training experience. The following documentation will be provided:

- Operating and Maintenance manual;
- Function and logic diagrams;
- Single line diagrams; and
- Protection diagrams.

## 8.3 Operating and Maintenance Manuals

The operation and maintenance manuals will provide the equipment suppliers' instructions required for safe operation and maintenance of the equipment.

Injasuti will collate the information supplied by the equipment suppliers and subcontractors for use by the operators on site.



## 9. DISPUTE RESOLUTION PROTOCOL

### 9.1 Purpose

A Dispute Resolution Protocol is based on the premise that two neighbours should work together to resolve potential disputes. This protocol suggests a process for people living in proximity to solar farms (hereafter referred to as the neighbours) and the operators of the solar farms (Injasuti) hereafter referred to as the operator) to resolve concerns related to reflection, noise, drainage and any related solar farm matters. The process will be a voluntary one, between the neighbour(s), and the operator. The protocol is intended to expeditiously resolve concerns locally and encourage positive relationships within the municipality. The process will commence at the date of construction start-up of the solar farm and continue for the life of the project until it is decommissioned.

### 9.2 Complaint Resolution

The solar farm operator will establish a call-in telephone number. In addition, voicemail messaging will be available twenty-four hours a day, seven days a week. The call-in telephone number will be distributed annually to all neighbours abutting and living in proximity to the solar farm. For emergency purposes, and if immediate contact is necessary, the message center will advise a caller of an emergency number and contact person.

The protocol establishes a one business day response time by the operator to received telephone complaints. Upon discussions with the neighbour(s) and documentation of all pertinent data, the operators will schedule a site visit at an appropriate time with the neighbour(s). The operator commits to setting up the meeting within two business days of the phone contact.

The operator will conduct an assessment of the potential impact within ten business days of the site visit. The assessment will be conducted by qualified professional staff using currently accepted industry practices, standards and equipment.

The operator will, complete a report identifying the complaint, confirming the site visit, provide an analysis of the preliminary measurement results and determine if any of the impact(s) exceeds the standard. The operator commits to meet with the resident as soon as possible after the report is complete to share the data collected. If the results collected during the preliminary testing confirm that additional testing is warranted, the operator will contract the services of professional staff.

Where the assessment identifies the need for mitigation measures, the operator shall implement these actions within fifteen business days of the submission of the report or at a date mutually agreeable to all parties. In the event it is not possible to complete the mitigation measures within the agreed time frame, the operators will temporarily idle the electrical equipment until such mitigation measures are implemented.

If the testing confirms that the operator is compliant with the Certificate of Approval or any other related approval, no further action will be taken by the operator. The neighbour(s) will be asked to acknowledge, in a letter, all site visits, impact assessments and mitigation measures taken, if any, to resolve the issue, within 30 days of the complaint resolution. Where no written acknowledgement is received within the time frame, it will be determined the issue is resolved.

If the neighbour(s) does not accept the findings by the operator, the resident has the option of registering a complaint with the MOE at the address listed below:

Ministry of the Environment  
London Regional Office  
2<sup>nd</sup> Floor 733 Exeter Road  
London ON N6E 1L3  
Toll free number from area code 519: 1-800-265-7672  
Tel: (519) 873-5000  
Fax: (519) 873-5020

### 9.3 Implementation

This Dispute Resolution Process is intended to address concerns between neighbour(s) and the operator quickly and in a cost effective manner. This process is voluntary for all participants on the basis that it is in everyone's interest to resolve matters prior to complex and costly alternative processes.

The information collected with respect to the complaint, assessment, mitigation measures and any mediation reports shall be maintained by the operator through the life of the project. This resolution process will help residents in the area understand the nature, response and mitigation measures for the complaints received.

This Dispute Resolution Process will be reviewed annually or more frequently if required, after commissioning of the solar farm, to determine opportunities for improvement.