NANTICOKE SOLAR

Draft Construction Plan Report

October 2016

TABLE OF CONTENTS

Page No.

List of Tables

List of Figures

1.0 INTRODUCTION

This report will detail the construction activities, the duration of these activities, any potential environmental effects that could result from these activities and proposed mitigation measures to be applied to the potential environmental effects.

The Nanticoke solar electricity generation project (herein referred to as "The Project") is being developed by Nanticoke Solar LP (herein referred to as "The Proponent"), which is a partnership between Ontario Power Generation (OPG), SunEdison Canadian Construction LP and Six Nations Development Corporation.

1.1 Project Contact

Name: Phil Shantz
Title: Environmental Planning Lead; ARCADIS
Address: 121 Granton Drive, Unit 12
Richmond Hill, ON L4B 3N4
Email: Phil.Shantz@arcadis.com

Name: Gillian MacLeod
Title: Senior Environmental Advisor; OPG
Address: 700 University Avenue; H18D16
Toronto, ON M5G 1X6
E-mail: Gillian.Macleod@opg.com

1.2 Project Summary

Nanticoke Solar LP is proposing to design, build and operate up to a 44 megawatts alternating current (MW_{AC}) solar electricity generation facility on and near the existing OPG Nanticoke Generating Station (G.S.) site in Haldimand County, Ontario (see Figure 1 – Site Location Plan) ("The Project"). The Project was selected through the Independent Electricity System Operator's (IESO) Large Renewable Procurement (LRP) I Request for Proposal (RFP). The proposed Project is classified under the O.Reg. 359/09 Renewable Energy Approval (REA) process as a Class 3 Solar Facility and will generate up to 44 MW_{AC}. The Project will convert solar energy into electricity to be fed into the Hydro One transmission grid.

The Project will require approval under Ontario Regulation 359/09 – Renewable Energy Approval (REA) under Part V.0.1. of the *Ontario Environmental Protection Act.* Subject to receiving all approvals, the preliminary schedule anticipates that full commercial operation will be achieved by March 9, 2019. The Project has received a 20-year LRP contract from the IESO to generate electricity and deliver it to the Ontario electricity grid. As such, the project is anticipated to operate until at least 2039, at which time it may continue to generate electricity or be decommissioned.

1.3 Project Facility and Equipment

The Nanticoke Solar Project is a Class 3 Solar Facility and is proposed to have a name plate capacity of 44 MW_{AC}.

Figure 1 – Site Location Plan

The major components of The Project are as follows:

- Monocrystaline or polycrystalline solar photovoltaic (PV) modules;
- Combiner boxes and cabling;
- Support posts installed in the ground, and a fixed or single-axis mounting structure to hold the PV modules;
- Substation (located on the Nanticoke GS lands), including: a primary transformer; switchgear; PT's, CT's and metering, control and communication equipment and potentially a tower for communication if required by Hydro One;
- Integrated inverter/transformer units to convert electricity from direct current to alternating current, and to step-up the voltage;
- Interior access roads and turnaround areas; and,
- Temporary laydown/staging areas for deliveries of materials and equipment.

2.0 CONSTRUCTION DETAILS

The work will meet all local regulations and standards.

2.1 Roads and Land Clearing

No permanent paved roads will need to be constructed to bring equipment to The Project. Municipal and provincial roads will be used for transportation of materials, workers, and equipment to the construction sites, as will the existing rail line that extends onto the Nanticoke GS lands. Minor modifications and improvements may be required to some of the existing roads (for example, widening the turning radius) for equipment transportation. Any road damage caused during construction will be repaired.

On-site access to the solar panels will be accessed by interior roads. Following completion of the construction phase, the interior roads will be used for maintenance and operating activities throughout the duration of The Project's operation.

The construction of the interior roads will be either temporary dirt roads, and compacted permanent interior roads. All topsoil will be kept and re-used on site. New culverts may be required to maintain drainage and to comply with best management practices of storm water management, and these will be constructed sufficient to support the construction equipment and delivery trucks. The exact culvert details (if any are required), installation details and erosion-control measures will be determined in during the detailed design phase and in conjunction with the Ontario Ministry of Environment.

Materials Brought On Site: Granular material for internal driveway construction, steel culverts.

Construction Equipment Used: Equipment will include, at a minimum: trucks, graders, and bulldozers, pile drivers, trenching equipment, vibrating compaction rollers, and excavators. The trucks and graders will be driven to the site and the larger equipment will be brought via trailers. All will be temporarily stored at Temporary Construction Laydown Area~~s~~ and throughout the site. The construction will generate noise and dust during construction typical to road construction. No chemicals other than fuel will be used. Road dust will be controlled with speed limits, and water as required.

Timing: During the construction phase, clearing and road construction will occur first, along with fence erection. These activities are planned to take place during the fourth quarter of 2017. Roads will be maintained (graded, compacted, and top-dressed with additional gravel, as may be required) throughout construction until commercial operation (between the fourth quarter 2017 and March 2019), and then limited road maintenance may be required very occasionally during the operation phase.

Clearing; and Material Generated: Some topsoil will need to be temporarily removed during the civil site preparation phase; however, it is anticipated that this soil will be temporarily stored on site in order to be redistributed after civil activities are complete. Most of the lands for the project are either in agricultural production or are in the former coal yard. There may be trees and vegetation that will be removed and disposed of by an approved and appropriate contractor.

2.2 Construction Laydown Areas

Portions of the Nanticoke GS lands, and the West, Centre and East Parcel lands will be used as construction assembly and laydown areas. Construction of laydown areas may include the removal of topsoil, and the installation of clean compacted crushed gravel on an as-needed basis, which is planned to be re-purposed when the laydown area is no longer required. Any topsoil removed will be re-used on site.

Materials Brought On Site: Granular material as required to maintain a stable base.

Construction Equipment Used: Equipment will include—at a minimum—cars, trucks, graders, and bulldozers, and vibrating compaction rollers. The cars, trucks and graders will be driven to the site and the larger equipment will be brought via trailers. The construction will emit minor amounts of noise and dust. No chemicals other than fuel will be used.

Timing: Preparation of the laydown and staging areas will be completed shortly after the site preparation, roads, and fencing. It is expected that this will occur in the fourth quarter of 2017, or first quarter of 2018. Laydown areas in the West, Centre and East Parcels may be left for the duration of the operations phase, or the aggregate materials may be reclaimed during or at the end of construction and those areas may be used for construction of PV array components.

Material Generated: No native material will be removed from site as a result of construction activity. Some construction waste will be generated (pallets, plastic packing material, etc.), which will be disposed of in accordance with applicable laws by a competent contractor.

2.3 Uses of Nanticoke GS Lands Existing Infrastructure

The Project will make use of some existing infrastructure at the Nanticoke GS Lands:

- Roads & Entrances: Existing paved and gravel interior access roads as well as existing entrances will be used by the Project. Some roads and entrances will be improved by adding width, gravel, or conducting grading activities.
- Parking areas: Existing parking areas, previously used for Nanticoke GS employee parking, will be used by the Project during construction.
- Rail Line: The existing rail lines entering and running through the Nanticoke GS lands may be used for delivering and receiving equipment at materials.
- Buildings: Nanticoke Solar may use and improve or modify three existing buildings for a variety of purposes related to construction and operation of The Project. The buildings which are planned for use by the solar project are the buildings previously referred to as the 'Performance and Testing Building'; the 'East Maintenance Building'; and the 'East Warehouse Building'. Use of these buildings may include without limitation such activities as:
    - Construction management and project management office space;
    - Material and equipment offload and storage;
    - Staging of materials and/or equipment;
    - Fabrication or Pre-fabrication of facility components in a sheltered environment;
    - Electrical control systems, substation component systems, and related SCADA or plant control/communication systems;
    - Storage of spare parts for the duration of the operation phase;
    - Maintenance of construction equipment and machinery.

2.4 Site Preparation and Inverter Station Installation

As the proposed site includes the former coal yard and agricultural lands there is little clearing and grubbing required on the land. There are a few isolated trees and bushes that would be cleared with a minor amount of vegetation removal. Some grading activities are proposed to generally level portions of the agricultural lands (this is discussed in the *Conceptual Stormwater Management Plan Report*). Prior to construction, the construction area will be fenced.

The site will be surrounded by a chain-link fence approximately 2 m tall for site security. The fence post holes will be augured and the fence posts placed into concrete and allowed to set. Once the posts have set, the metal chain link fence will then be secured. The fencing used will prevent access to large animals and humans.

Inverter/transformer units will be placed on concrete pads or metal piers. The topsoil at the inverter station will be removed and crushed gravel will be imported on an as-needed basis. The excavated topsoil will be re-used on site as feasible.

Materials Brought On Site: Dependent on whether the inverter/transformer units will be placed on a concrete slab on grade, or on metal posts, the following materials may be required: Granular material as required to maintain a stable base. Cement mix, delivered via cement mixer trucks for the concrete, and rebar. Also, possibly metal posts for the support columns.

Construction Equipment Used: Equipment will include, at a minimum, trucks, cement trucks, graders, and bulldozers, pile driving rigs, vibrating compaction rollers. The trucks and graders will be driven to the site and the larger equipment will be brought via trailers. The construction will emit minor amounts of noise and dust. No chemicals other than fuel will be used.

Timing: Preparation of the support structures for inverter/transformer units will take place approximately mid-way through construction, and this activity is currently targeted to take place within approximately the second or third quarter of 2018.

Material Generated: No material is expected to be generated that will need to be disposed of off site. There is potential that some soil may need to be excavated and moved to an alternate location on the site, if concrete pad structured are used.

Temporary Uses of Land: Preparation of the support structures for the inverter/transformer units will be permanent, for the duration of the operation phase.

2.5 Delivery of Equipment

Equipment will be delivered by truck and trailer as needed throughout the construction phase and stored at the temporary construction laydown area and indoor warehouse facility, within the project location. These deliveries will typically occur during normal construction hours, typically 7 am to 7 pm and may include weekends. A Conceptual Construction Traffic Management Plan will be developed in coordination with the municipality. Prior to the start of construction, a road assessment of municipal roads that may be impacted will be undertaken, and a road use agreement will entered into with the Municipality, which will govern the use of municipal road for equipment deliveries. Nanticoke Solar has indicated that

the three roads to be utilized and that should be covered in the assessment would be Highway 55 (Nanticoke Road) to the Nanitcoke GS, Rainham Road and South Coast Drive.

Railway delivery of major equipment is a possible alternative and may reduce road construction traffic. The delivery will be consistent with normal construction hours above.

2.6 Installation of Piles & Module Support Structure

Based on a geotechnical assessment and engineering report, the pile (or metal support post) design will be developed and finalized. Possible designs for the support posts include, for example: H-channel, C-channel or W-channel straight, driven or vibratory-installed piles; helical or screw piles, or cylindrical piles installed in a drilled hole (potentially using grout or concrete), or alternatively, anchored to an above-ground concrete ballast block. The module mounting structure will be affixed to the metal piles, and will be in either a fixed or single-axis tracking configuration. Further details on the racking system and supporting structures are provided in the *Design and Operations Report*.

Materials Brought On Site: Metal posts, metal mounting structures and ancillary hardware, equipment and electronics, and potentially concrete, if required by the pile design.

Construction Equipment Used: Equipment used may include:

- Excavator for removing material;
- Pile vibration rig or drill rig to prepared holes for and install pile;
- Flatbed trucks for deliveries and potentially used by construction personnel to install structure;
- Concrete trucks for delivery of concrete (if necessary);
- Construction trucks (3-4 vehicles with multiple visits); and
- Dozer, loader and trucks to backfill and compact foundation and remove surplus excavated materials.

The trucks will be driven to the site and the larger equipment brought via trailers. The construction will emit minor amounts of noise and dust. If drill rigs are used, there is the potential for loud noise to be generated during drilling. No chemicals other than fuel will be used.

Timing: This activity will occur after civil activities, roads, and fencing is complete. The planned timing of this activity is expected to be approximately the first, second and third quarter of 2018.

Material Generated: Spent welding rods may be generated which will be disposed of as hazardous waste by a licensed contractor. Any excavated subsoil may be placed elsewhere on site, or may be removed from the site and disposed of in an appropriate manner.

2.7 Solar Panel Assembly and Installation

The exact quantity of modules to be used is dependent on module size, type, wattage and available space. With the exception of light crane trucks and flatbed trailers/hay wagons (storage and module transfer), the assembly work is manual and requires a number of smaller hand tools; small electrical tools may be required to join tubes that comprise the array skeleton, however assembly via hardware

connection remains the preferred form of rack assembly. Partial assembly of racking and electrical wiring may be completed by the equipment or material vendor prior to delivery to site.

The installation and assembly procedure consists of mounting the structure components to the posts, fastening the rack elements together, joining tubes and mounting and fastening the PV modules to the assembled rack.

Materials Brought On Site: Solar panels, connectors, bolts and mechanical connecting hardware, clips, harness cables.

Construction Equipment Used: Flatbed trailers; boom-lifts. No chemicals other than fuel will be used.

Timing: This activity will commence shortly after the commencement of the pile and racking installation activities. The planned timing of this activity is expected to be approximately the first, second, and third quarter of 2018.

Material Generated: Some packing material waste will be generated. The recyclable material will be separated from the non-recyclable material onsite. Both streams of waste will be removed by a licensed sub-contractor.

2.8 Electrical Collector System

The electrical collector system will consist of above-ground wiring from the panel strings to the combiner boxes which are in turn connected to the inverter/transformer units via either above ground harnesses or direct buried cables. Harness-mounted, pole-mounted or underground cabling will then run from the inverter/transformer units to the main substation, where the voltage will be stepped up to connect to the Hydro One 230 kV transmission system.

Suitable grounding will also be installed where required by applicable codes and standards.

Materials Brought On Site: Electrical cabling, poles, electrical components, sand for trenching, harness clips, junction boxes.

Construction Equipment Used: Flatbed trailers, trenching equipment, cable-pulling equipment, truck-mounted augers for creating holes for electric utility poles, directional boring machinery may be used. The construction will emit minor amounts of noise and dust. No chemicals other than fuel will be used.

Timing: This activity is expected to take place concurrently with module installation. The planned timing of this activity is expected to be approximately the first, second, and third quarter of 2018.

Material Generated: Some packing material waste will be generated; some excess cable lengths may remain. The recyclable material will be separated from the non-recyclable material onsite. Both streams of waste will be removed by a licensed sub-contractor.

2.9 Substation

The electrical substation for The Project will be located on the Nanticoke GS lands near the Hydro One Nanticoke switchyard. The substation equipment will include a 230 kV main power transformer, switchgear, station service equipment; revenue grade PT's, CT's and metering, a permanent control building, and control and communication equipment. The substation area will be surrounded by a chainlink fence with a locked gate.

Materials Brought On Site: Aggregate materials, disconnect switch, circuit breakers, a main power transformer, switchgear, station service transformers; revenue grade PT's, CT's and metering, control and communication equipment.

Construction Equipment Used: A truck mounted crane, flatbed trailers and a bulldozer. The bulldozer and control house will be delivered to the site by a flatbed trailer. The construction will emit minor amounts of noise and dust. No chemicals other than fuel and transformer oil will be used.

Timing: This activity will occur late during construction, and is planned to be completed prior to the fourth quarter of 2018.

Material Generated: Some packing material waste will be generated. The recyclable material will be separated from the non-recyclable material onsite. Both streams of waste will be removed by a licensed sub-contractor.

2.10 Clean-up and Reclamation

Waste and debris generated during the construction activities will be collected and disposed of at an approved waste management/transfer facility. All reasonable efforts will be made to minimize waste generated and to recycle materials including returning packaging material to suppliers for reuse/recycling. During construction, industry best practices for spill prevention will be utilized. In the unlikely event of a minor spill, this will be cleaned up immediately and any impacted soils will be removed from site and disposed of at an approved and appropriate facility. At the conclusion of construction, vehicles and construction equipment will be removed from the site.

Topsoil that was removed during construction will be replaced and re-contoured over disturbed areas, and the West, Centre and East Parcel lands will be seeded with vegetation. Stormwater control materials and equipment installed for the duration of the construction phase will be removed once inspections have determined that the threat of erosion has diminished to the original pre-construction levels or lower. Stormwater Management activities and infrastructure will be in accordance with the Conceptual Storm Water Management Plan Report.

2.11 Project Commissioning

Commissioning of The Project will occur once the solar panels and electrical system are fully installed and Hydro One is ready to accept grid interconnection. The commissioning activities will consist of testing and inspection of the electrical, mechanical and communications systems.

Materials Brought On Site: Specialized hand-held testing equipment.

Construction Equipment Used: None.

Timing: This will be the final construction activity, and is currently planned to take place during or after the third quarter of 2018, and no later than March 2019.

Material Generated: None.

2.12 Summary of Equipment and Material Requirements

The estimated amount of materials and truckloads required for site preparation and construction are included in Table 1. The construction equipment to be used during construction is included in Table 2.

Table 1 – Estimated Construction Materials

Note that these values are estimates, and the total quantity and loads may increase or decrease dependent on final detailed design.

Material	Truck Type	Number of Loads	Estimated Quantity	Storage Location
PV Modules	Semi-trailer	300-500	150,000 – 220,000	Laydown area
Support Structures	Semi-trailer	200-300	6,800 – 10,000	Laydown area
Steel Support Posts	Semi-trailer	45-240	13,000 – 70,000	Laydown area
Inverters Stations	Semi-trailer	11-28	11 - 28	On-site
Electric Conduits and Cables	Semi-trailer	200+	Multiple Spools of harness, DC, AC & ground cable	Laydown area/ Storage Building
Combiner Boxes and Connectors	Semi-trailer	5+	8,000 – 17,000	Laydown area/Storage Building
Control House	Semi-trailer	5	1 lot	Substation area
Main Power Transformer	Semi-trailer	1	1 lot	Substation
Concrete	Concrete truck	If Req'd	If Req'd	n/a
Gravel	Dump truck	250+	As req'd by final design	n/a

Table 2 – Estimated Construction Equipment

Equipment	Weight	Number (up to)
Track-type tractor	37.6 T	4
Wheel-type tractor	25.6 T	4
Excavator	25.9 T	4
Backhoe Loader	8.9 T	5
Wheel Loader	20.5 T	3
Dump Truck	19.5 T	8
Motor Grader	18.8 T	2
Compactor	10.9 T	3+
Crane	49.9 T	1
Pile Driving Equipment	19.5 T	6
Trenching Equipment	19.5 T	6
Telescopic handler	10.0 T	8
Concrete mixer	20-25 T	6 as req'd
Container Boxes	7-16 T	8+
Pick-up trucks	2.6 T	15
Generators	N/A	11+
Hand tools	N/A	multiple

3.0 LOCATION AND TIMING OF CONSTRUCTION

The construction activities will generally be located in two areas: the Nanticoke GS lands, and the West, Centre & East Parcel lands. Delivery and Construction Activities will take place on:

1. Transportation of equipment to the site will utilize public roadways; and
2. Construction on the leased property.

3.1 Schedule

Construction activities will commence once all necessary permits (REA, building permits, etc.) have been obtained and the weather conditions are conducive to construction. The following table outlines the duration each activity typically takes. Following site grading, construction will move from one end of the site to the other and will follow an assembly line type process. Therefore, there will be considerable overlap of activities. Similarly, the construction of the electrical collector system and the substation can be constructed while the foundations are being built and the panels are being installed.

Table 3 – Duration of Construction Activities

Activity	Total Duration	Notes
Surveying	2 days	
Fencing, clearing, vegetation removal and grading and interior road construction	1.5 months	
Pile & mounting structure Installation	4 months	Partially concurrent with other activities
Module Installation	4 months	Partially concurrent with other activities
Installation of electrical collector system	3-6 months	Partially concurrent with other activities
Substation installation and connection to distribution grid	5 months	Partially concurrent with other activities
Clean up and reclamation	1 month	
Site commissioning	1 month	

4.0 POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

4.1 Archaeological Resources

Construction of The Project will result in solar panels covering large portions of the proposed study area. As such, construction has the potential to disturb archaeological resources, should they exist on the site.

A Stage 1 and 2 archaeological assessment has been completed by This Land Archaeology Inc. along with participation from monitors from Six Nations Council and Mississaugas of New Credit. The Report is titled: *Report on the Stage 1 & 2 Archaeological Assessment in Support of the Nanticoke Solar Project, Located on Part of Lots 7 – 11, Concession 3, Town of Nanticoke, Regional Municipality of Haldimand County, Geographic Township of Walpole, Ontario*. That Report: describes the development, historical and archaeological context of the area and the subject lands; describes the archaeological assessment methodology; and, provides an analysis of the various finds and their associated locations.

The completed Stage 1 and 2 archaeological assessment resulted in the discovery of 60 archaeological resources; 39 Isolated Findspots, 15 Informal Archaeological Sites and 6 Archaeological Sites; of these resources 6 are recommended for further investigation via Stage 3 assessment (further recommendations for Stage 4 mitigation may follow upon completion of Stage 3 assessment).

The report is submitted to the Ministry of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. A letter of concurrence from the Ministry of Tourism, Culture and Sport will be sought in the fall of 2016 for the above noted report.

As the Stage 1 and 2 assessment did result in the identification of certain sites that will require Stage 3 and 4 assessments. Nanticoke Solar expects to complete Stage 4 assessments on all the sites and therefore free up all the lands for construction. If however, decisions are made to not undertake specific Stage 4 assessments the finds will be appropriately protected and buffered from development. The Stage 3 and 4 work would be undertaken in 2017 with the resultant studies submitted to MTCS and concurrence letters obtained prior to the start of construction.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.

If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations.

The Cemeteries Act, R.S.O. 1990 c. C. 4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (when proclaimed in force) require any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

4.2 Cultural Heritage Resources

A cultural heritage assessment titled: *Cultural Heritage Assessment Report: Proposed Nanticoke OPG Solar Project* by Chris Uchiyama Heritage has been undertaken and submitted to MTCS. This Report is

available for public review and is available on the Nanticoke Solar website. Based on the current design of the project, no negative project related impacts on potential heritage attributes have been identified.

4.3 Destruction of Vegetation and Habitat

Beacon Environmental Limited (Beacon) prepared a *Natural Heritage Assessment and Environmental Impact Assessment Study*. The *Natural Heritage Assessment and Environmental Impact Study* is required to fulfil the requirement under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). The Natural Heritage Assessment (NHA) report is provided to the Ministry of Natural Resources and Forestry for review and confirmation as part of the Renewable Energy Approval (REA) application to the Ministry of Environment and Climate Change (MOECC).

A NHA is required for proposed renewable energy projects to determine whether the following natural heritage features are within 120 m and 50 m of the proposed project location: Significant Woodlands; Significant Wetlands; Significant Valleylands; Significant Wildlife Habitat; Provincial Parks; Conservation Reserves; or Area of Natural and Scientific Interest (Earth or Life Science). An Environmental Impact Study (EIS) report was prepared to identify any potential negative environmental effects during construction, operation and decommissioning, and how they will be addressed during mitigation and monitoring.

The *Natural Heritage Assessment and Environmental Impact Study* includes a Records Review, Site Investigation, Evaluation of Significance, and Environmental Impact Study (EIS) where any natural features within the Project Location, and the lands within 50 m of the project location were identified. The following natural heritage features were identified as being in or within 50 m of the Project Location during the background review, consultation with agencies, and field investigation, and were therefore carried forward to the EIS:

- Wetlands;
- Woodlands;
- Planted Tallgrass Prairie;
- Planted Species of Special Concern (Nodding Wild Onion, Pale-Purple Coneflower, Prairie Dock and Tall Coreopsis), which are all associated with the Planted Prairie Feature; and
- Generalized Candidate Significant Wildlife including:
  - Bat Maternity Colonies;
  - Species of Special Concern – Woodland Plants (Harlberd-leaved Smartweed, Hirsute Sedge and Weak Stellate Sedge);
  - Bird Species of Special Concern (Eastern Wood-Pewee, Peregrine Falcon and Red-headed Woodpecker);
  - Reptiles and Amphibians of Special Concern (Eastern Ribbonsnake, Jefferson / Blue-Spotted Salamander Complex and Snapping Turtle); and
  - Woodland Vole.

Four of the six wetlands identified through the Site Investigation were assumed to be significant and evaluated using the evaluation of significance criteria. There is no development proposed within any wetlands that are assumed to be significant in or within 50 m of the Project Location. No direct impacts to wetlands that have assumed to be significant that are located in or within 50 m of the Project Location are

anticipated as there will be not direct loss of wetland habitat or function, and a minimum 20 m buffer is being maintained from the edge of each woodland to the nearest Project component.

Potential negative effects to wetlands associated with the construction, operation, and decommissioning phases of the Project are outlined in detail within Table 13 of the *Natural Heritage Assessment and Environmental Impact Study* along with mitigation measures.

Three of the woodlands in or within 50 m of the Project Location meet the criteria for significance based on the evaluation of significance criteria outlined in the *NHA Guide for Renewable Energy Projects* (Figure 6 of the *Natural Heritage Assessment and Environmental Impact Study)*. There is no development proposed within any significant woodland. The specific distance from each significant woodland to the Project Location is provided in Table 12 of the *Natural Heritage Assessment and Environmental Impact Study*; a minimum 10 m buffer has been maintained from the boundary of each woodland to the Project Location

No direct impacts to woodlands are anticipated as no woodland is being removed, and a minimum 10 m buffer is being maintained from the edge of each woodland to the nearest Project component.

Indirect negative effects to woodlands resulting from construction and decommissioning activities including dust generation, sediment and erosion, waste management are expected to be temporary, and will be mitigated through standard construction management practices. Other indirect impacts may occur though accidental spills or accidental damage to tree roots or limbs.

All indirect negative effects will be controlled through the use of standard mitigation measures, as outlined *Natural Heritage Assessment and Environmental Impact Study*.

The proposed mitigation measures for wetlands and woodlands would include the following:

- Design and implement erosion and sediment control plan – including silt fences when work is within 30 m of a wetland or woodland;
- Temporarily suspend work if excessive runoff or sediment is observed;
- Stockpile materials at a distance greater than 30 m from wetlands and woodlands;
- Use pervious materials on roads;
- Limit traffic on disturbed soil;
- Maintain existing grading, where feasible;
- Construct roads at or near existing grade, where feasible;
- Maintain fence around perimeter of Project – discourage workers from entering wetland and woodland areas;
- Maintain minimum of 20 m buffer around wetlands and 10 m around woodlands;
- Stabilize and/or re-vegetate all areas of disturbed soils that drain into wetlands and woodlands;
- Identify a designated area for equipment maintenance and fueling;
- Storage of fuel should only occur in permitted areas;
- Maintain an emergency spill kit on-site in case of emergency;
- Develop a spill response plan;
- Use native seed mixes;
- Use native topsoil;
- Clearly delineate work area prior to construction;
- Discourage workers from entering woodland and wetland areas;

- If lighting of the area is proposed as part of the development plan ensure that it is installed in such a way that light is not directed towards natural areas either through the strategic placement of lights or the use of light shields; and
- Clearly post speed limits.

A Planted Tallgrass Prairie is located in the centre of the Project Location. The planted prairie and the planted Species of Conservation Concern will be removed to facilitate the installation of the solar panels, perimeter fence and access road. The removal of the planted prairie feature and these plants will be permanent. A compensation habitat has been identified. The new habitat will include 27.9 ha of grassed habitat and more details are provided in the *Natural Heritage Assessment Report*.

Five Generalized Candidate Significant Wildlife habitat types were identified within the 50 m setback from the Project Location; however, it is not expected that construction or decommissioning activities will have any negative effect on these features. As outlined in the *NHA Guide for Renewable Energy Projects* (OMNR 2012), potential impacts to these habitats are typically associated with the temporary disturbance from construction and decommissioning activities and are grouped together as generalized impacts and mitigation measures.

As described above, removal of vegetation within significant natural features will be limited to the planted tallgrass prairie. Additional vegetation removal will occur within the agricultural fields, and within hedgerows. When vegetation removal is required, the following mitigation measures will be implemented:

- When appropriate, the limits of the vegetation to be cleared will be identified prior to clearing so that the minimum required amount of vegetation is removed;
- When clearing is to occur adjacent to a natural feature, the limit of the clearing area will be staked so that sensitive natural features are not disturbed;
- Clearing limits will be monitored to ensure that no encroachment on natural features has occurred, and the minimum amount of vegetation is removed;
- If encroachment on a natural feature occurs, restoration of the feature may take place under the direction of a qualified biologist.

The federal *Migratory Bird Convention Act* (1994) protects the nests, eggs and young of most bird species from harm or destruction. Environment Canada considers the ‘general nesting period’ of breeding birds in southern Ontario to be between late March and the end of August. This includes times at the beginning and end of the season when only a few species might be nesting. In light of this we recommend that during the peak period of bird nesting, between April 01 and August 15, no vegetation clearing or disturbance to nesting bird habitat occur. Vegetation includes grasses. In the ‘shoulder’ seasons of, we suggest that vegetation clearing could occur, but only after an ecologist with appropriate avian knowledge has surveyed the area to confirm lack of nesting. If evidence of nesting is observed, then vegetation clearing (in an area around the nest) has to wait until nesting has concluded. Generally speaking, the smaller and simpler the habitat is, the easier it is to confirm that no nesting is occurring. Likelihood of nesting birds being present in the ‘shoulder’ seasons also depends on the habitat type. Between September 1 and March 31, vegetation clearing can occur without nest surveys, but the law for nest protection still holds (i.e. if an active nest is known it should be protected).

4.4 Dust and Noise

The project is a Class 3 solar facility and will not emit any air or odour emissions beyond those described in section 4.1. Some dust is expected to be created during construction and decommissioning. Further discussion of the potential effects and mitigation measures is included in section 4.7.

4.5 Stormwater Runoff Impacts

Arcadis has prepared a *Conceptual Stormwater Management Plan* for the proposed project. The stormwater management plan focuses on two main development areas: the coal pile located east of Nanticoke GS, and the agricultural lands located to the northeast of Nanticoke GS.

The proposed stormwater management plan will utilize existing stormwater drainage patterns and features in order to minimize downstream impacts. Since solar panels do not increase the impervious area of the land surface, minimal changes to the quantity and quality of the stormwater runoff are anticipated. The impervious areas for the proposed development (i.e. gravel access roads) account for less than 1.5% of the project area.

Consultation with the Long Point Region Conservation Authority has been on-going during the development of the *Conceptual Stormwater Management Plan.*

Coal Pile SWM Plan

The coal pile area currently utilizes a stormwater management system consisting of catch basins, culverts, ditches and lagoons licensed under Environmental Compliance Approval Number 4953-99FLYS. In general, the post-development plan for this area is to utilize the current SWM infrastructure as is. The proposed development area grading and drainage is anticipated to be improved since the coal pile is removed and the area will be covered with grass to promote treatment and infiltration. No anticipated increase in stormwater runoff is expected for this proposed development area.

West, Central and East Parcel Lands SWM Plan

Existing drainage patterns, grades as well as final discharge points will be maintained, where possible. Minor alterations to site grading will be implemented to ensure the flood plain is controlled from proposed development plan area. In addition, the proposed development area will be covered with grass to promote treatment and infiltration. Minimal changes in stormwater runoff is expected for this proposed development area. Incremental increase of peak flow from the outlets of the proposed development area are maintained below 1%. Since the main discharge outlet of the proposed site area is Hickory Creek which immediately thereafter drains to Lake Erie, there are no anticipated issues posed by the marginal increase in stormwater runoff.

Erosion and Sediment Control

Temporary erosion and sediment (E&S) control measures will be implemented during the construction phase of this project. In general, light duty silt fences will be implemented along the perimeter of the site as well as any waterways within the proposed site development area. Additionally, hay bales will be placed around any catch basins and culverts located within the proposed site development area. Mud mats will be utilized on site entrance ways which are directed to local roadways. Once the construction phase has

been completed and the vegetation has grown within the proposed development area, the temporary measures will be removed and vegetation will provide long-term E&S control. More detailed best management practices can be found in the *Conceptual Stormwater Management Plan*.

4.6 Impacts on Waterbodies

Beacon and ARCADIS prepared a *Water Assessment and Waterbody Report for Nanticoke Solar Project*. A Water Assessment is a required component of a REA application. The Water Assessment includes a records review and a site investigation to determine the presence and the boundaries of waterbodies as defined by O.Reg. 359/09 and are within 120 metres (m) of the Project Location or within 300 m of the average annual high water mark of a Lake Trout lake that is at or above development capacity. If waterbodies are identified within 120 m of the Project Location, a Waterbody Report (including an EIS) is required.

The Water Assessment and Waterbody Report identified one Lake (Lake Erie) and two of eight watercourses met the definition of waterbodies as specified in O. Reg. 359/09. The remainder of the water features identified through the Records Review either could not be located during ground-truthing (as they were not present) or were features that did not meet the definition of a waterbody under O. Reg. 359/09.

Within the Project Location and 120 m setback; one watercourse, WC2 or an unnamed tributary of Hickory Creek was determined to be a permanent stream; and WC7, also an unnamed tributary of Hickory Creek was determined to be an intermittent stream (see Figure 4 in the *Water Assessment and Waterbody Report for Nanticoke Solar Project*). The site investigation confirmed that portions of the Project are located within 120 m of the Lake Erie shoreline and, in the case of the solar panel field proposed for the former coal pile, encroached on the 30 m buffer adjacent to the hardened shoreline. All three features were advanced to an EIS as per sections 37 and 38 of O. Reg 359/09.

Potential negative effects to water features associated with the construction, operation, and decommissioning phases of the Project are outlined in detail within Table 9 of the *Water Assessment and Waterbody Report for Nanticoke Solar Project* along with mitigation measures. The proposed mitigation measures would include:

- Prohibit access to waterbodies and riparian area;
- Maintain a minimum 30 m vegetated buffer from waterbodies;
- Design and implement erosion and sediment controls;
- Stabilize and/or re-vegetate all areas of disturbed soils that drain into watercourse;
- Design drainage system to avoid diversion of, or otherwise minimize changes in drainage;
- Develop a spill response plan;
- Incorporate a designated area for equipment maintenance and fueling;
- Store fuel in permitted areas;
- Maintain an emergency spill kit on-site in case of emergency;
- All equipment should be maintained in good working order and be free of material that could contribute deleterious substances to waterbodies;
- Fuelling areas and storage should be kept at least 30 m from all watercourses and waterbodies;
- Confirm erosion hazard setback limit for any physical structures;
- Stabilize any areas impacted within erosion hazard limits;

- Control post-development flow rates from the site outlets to maintain the pre-development levels in consultation with the Long Point Region Conservation Authority;
- If removal of vegetation within the vicinity of the watercourses is necessary it should be undertaken when the channels are dry or during low flow conditions thereby reducing the potential for increased erosion and sediment transport into the watercourses;
- A comprehensive erosion and sediment control plan will be developed and implemented during the construction and decommissioning phases of the project to reduce or eliminate the transport of sediments, nutrients, contaminants, and increased turbidity within these features (see *Conceptual Stormwater Management Plan Report*, Arcadis 2016). Siltation and erosion controls should be installed before any work on the Project Location begins, and removed after the threat of siltation and erosion effects has ceased. The siltation and erosion measures should be checked regularly during the construction and decommissioning phases to ensure it remains in good condition. Any deficiencies in the measures should be repaired;
- Grading activities should aim to minimize changes in natural drainage in order to reduce the potential for changes to hydrological patterns.

The southern portion of the Project Location encroaches within the 30 m setback from the Lake Erie shoreline. This location described above is within the decommissioned Nanticoke GS coal storage facility that is protected from Lake Erie by a berm/perimeter road and armor stone/riprap revetment. Stormwater runoff from the former coal storage area is managed by an onsite treatment system to prevent any contaminated runoff from reaching Lake Erie. The storage facility has been rehabilitated and the stormwater management system will remain in place as outlined in the Conceptual Stormwater Management Report. The specific location where the encroachment occurs is in a portion of the coal storage area that also encroaches within this limit (the berm/perimeter road is modified at this location to allow for the encroachment, while still protecting the area from Lake Erie). The potential project effects and standard mitigation measures outlined above will also be put in place for this area. In addition, and as indicated above any stormwater in this location is managed by the onsite treatment system already in existence.

A detailed table of potential effects to waterbodies appears as Table #9 in the *Water Assessment and Waterbody Report for Nanticoke Solar Project* and is presented below.

Table 4 – Waterbody Potential Effects and Mitigation Measures

Activity	Potential Physical Effects	Potential Effects on Waterbody Form or Function	Potential Mitigation Measures
Construction Phase			
• Surveying and Geotechnical Activities • Roads and Civil Site Preparation • Construction Assembly and Laydown Area • Site Preparation and Inverter Station Installation	• No physical impacts with the potential for adverse effects are anticipated • Increased erosion and sedimentation potential • Change in nutrient concentrations • Change in surface water drainage • Change in soil compaction • Removal of vegetation • Surface water and groundwater contamination due to fuel and/or chemical spills	• No adverse effects on waterbody features are anticipated • Decreased bank/shoreline stability • Alteration to surface water quality • Alteration to surface water quantity • Habitat impairment • Loss of food organisms • Alteration of fish community species composition • Lethal or sub-lethal toxic effects on aquatic species	• No mitigation required • Prohibit access to waterbodies and riparian area • Maintain a minimum 30 m vegetated buffer from waterbodies • Design and implement erosion and sediment controls • Stabilize and/or re-vegetate all areas of disturbed soils which drain into watercourse • Design drainage system to avoid diversion of, or otherwise minimize changes in drainage • Incorporate a designated area for equipment maintenance and fueling • Storage of fuel should only occur in permitted areas • Maintain an emergency spill kit on-site in case of emergency • Develop a spill response plan • Confirm erosion hazard setback limit for any physical structures
• Delivery of Equipment • Installation of Racking System • Solar Panel Assembly and Installation • Electrical Collector System • Substation • Clean-up and Reclamation	• Contamination due to fuel and/or chemical spills	• Lethal or sub-lethal toxic effects on aquatic, wetland and terrestrial biota • Changes in fish species composition and aquatic and riparian plant communities	• Incorporate a designated area for equipment maintenance and fueling • Storage of fuel should only occur in permitted areas • Maintain an emergency spill kit on-site in case of emergency • Develop a spill response plan • Confirm erosion hazard setback limit for any physical structures • Stabilize any areas impacted within erosion hazard limits
Operation Phase			
• General Operation	• Increased area of impervious or less pervious surfaces	• Alteration to surface water quality • Alteration to surface water quantity • Habitat impairment • Loss of food organisms • Change in thermal regime • Alteration of fish species community composition	• Control post-development flow rates from the site outlets to maintain the pre-development levels in consultation with the Conservation Authority

Activity	Potential Physical Effects	Potential Effects on Waterbody Form or Function	Potential Mitigation Measures
Operation Phase			
• Routine maintenance activities	• Surface water and groundwater contamination due to fuel and/or chemical spills	• Lethal or sub-lethal toxic effects on aquatic, wetland and terrestrial biota • Alteration of fish species community composition	• Incorporate a designated area for equipment maintenance and fueling • Store fuel only occur designated areas • Maintain an emergency spill kit on-site in case of emergency • Develop a spill response plan
Decommissioning Phase			
• Dismantling	• Surface water and Groundwater contamination due to fuel and/or chemical spills	• Lethal or sub-lethal toxic effects on aquatic, wetland and terrestrial biota • Changes in fish species composition and aquatic and riparian plant communities	• Incorporate a designated area for equipment maintenance and fuelling • Storage of fuel should only occur in permitted areas • Maintain an emergency spill kit on-site in case of emergency • Develop a spill response plan • Stabilize any areas impacted within erosion hazard limits
• Land Restoration Activities	• Increased erosion and sedimentation potential • Change in nutrient concentrations • Change in surface water drainage • Change in soil compaction • Removal of vegetation • Surface water and groundwater contamination due to fuel and/or chemical spills	• Decreased bank stability • Alteration to surface water quality • Alteration to surface water quantity • Habitat impairment • Loss of food organisms • Alteration of fish community species composition • Lethal or sub-lethal toxic effects on aquatic species	• Prohibit access to waterbodies and riparian area • Maintain a minimum 30 m vegetated buffer from waterbodies • Design and implement erosion and sediment controls • Stabilize and/or re-vegetate all areas of disturbed soils which drain into watercourse • Design drainage system to avoid diversion of, or otherwise minimize changes in drainage • Incorporate a designated area for equipment maintenance and fuelling • Storage of fuel should only occur in permitted areas • Maintain an emergency spill kit on-site in case of emergency • Develop a spill response plan • Stabilize/restore any areas impacted within erosion hazard limits

4.7 Water Takings

There will be no permanent operations building onsite and no water taking is expected during the operations phase. Water-taking during the construction phase may be required during wet times of year to move water from one location within the project to another, in order to reduce wetness of areas where construction activities are planned. It is expected that during these short durations, no greater than 50,000L/day will be required. If a greater amount of water is required, Nanticoke Solar will seek and obtain a Permit to Take Water.

4.8 Fuels Spills

It is possible that fuel spills could occur during construction. All equipment operators will be trained to avoid spills and to respond to spills should they occur. No re-fueling will be permitted within 120 m of a water body. Should a spill occur the following protocol will be implemented:

1. Spill response kits kept onsite will be used to contain the spill;
2. Nanticoke Solar representative will be notified;
3. If the spill is of sufficient quantity, the MOE Spill Action Centre will be notified;
4. The environmental representative or a contractor will remove any excess fuel and impacted soils; and
5. An environmental consultant will be retained to ensure that all impacted soil and groundwater has been properly removed and the site returned to pre-spill condition.

4.9 Potential Impacts by Activity

Potential impacts related to construction activities are presented below.

Environmental Component Affected	Natural Heritage, Watercourse, Archaeological Resources.
Potential Impacts	Sensory disturbance of wildlife and birds due to construction. Soil excavation for on-site access roads and laying of gravel base will cause disturbance to the terrain and could result in accidental damage to tree roots and limbs, and increased erosion and sedimentation. The access roads will remain for project life. Changes in surface water run-off, natural drainage to wetlands and woodlands and altered watercourse flow due to grading changes and soil compaction. Encroachment on wetland, woodlands watercourses and their buffers during construction. Introduction of invasive species during construction. Changes in species composition in wetland and woodland communities due to accidental spills. Potential impact to archaeological resources. Municipal and provincial roads may be damaged during use.
Mitigation Measures	Site clearing and grubbing will be minimal and in a defined area. Sedimentation controls will be put in place around stockpiled soils, ditches and disturbed areas within 120 m of a watercourse, wetland and woodland. Excavated soil will be re-used on-site where feasible, or disposed of in a proper facility off-site. Excavated soil will be stored a minimum of 30 m from wetlands, woodlands and watercourses.

	No vegetation clearing during breeding bird season.
	Standard BMPs for dust control, road construction and erosion control.
	Erect a perimeter fence to avoid encroachment on wetland, woodland and watercourse.
	Stabilize and/or re-vegetate all areas of disturbed soils that drain into wetlands, woodlands and watercourses.
	Site will be re-vegetated with native seed mixes as soon as possible to avoid the establishment of non-native invasive species.
	Develop and implement a spill response plan, identify designated areas for equipment maintenance and fueling, maintain emergency spill-kits onsite.
	A Stage 3 and 4 archaeological assessment will be undertaken as per the recommendations in the Stage 1 and 2 Report.
	If a Stage 4 assessment is not completed on certain finds the areas will be protected and appropriately buffered.
	If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations.
	Any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.
	Any damage to municipal roads will be repaired and the road returned to its previous condition.
	No permanent paved roads will need to be constructed for the construction activities.
	The Rail Line and Municipal and provincial roads will be used for transportation of equipment to the construction sites. Any road damages will be repaired in conjunction with the relevant authorities.
Residual Impacts	None anticipated.

4.9.1 Road and Lands Clearing

4.9.2 Construction Laydown Areas

Environmental Component Affected	Terrain, Natural Heritage, Watercourses, Archaeological Resources.
Potential Impacts	Increased sedimentation and changes in surface water run-off, natural drainage to wetland, woodland and watercourse due to minor grading changes and soil compaction. Increased dust generation. Accidental damage to tree limbs or roots during use. Encroachment of wetlands and woodlands. Changes in species composition in wetland and woodland communities due to accidental spills.
Mitigation Measures	No vegetation clearing during breeding bird season. Use of perimeter fencing to buffer areas of significance. Standard BMPs for dust control, road construction and erosion control. Use of the Nanticoke GS site for some laydown area will reduce the potential impact. Develop and implement a spill response plan, identify designated areas for equipment maintenance and fueling, maintain emergency spill-kits onsite. Site will be re-vegetated after construction. Standard BMPs for dust control, road construction and erosion control. A Stage 3 and 4 archaeological assessment will be undertaken as per the recommendations in the Stage 1 and 2 Report. If a Stage 4 assessment is not completed on certain finds the areas will be protected and appropriately buffered. If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations. Any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.
Residual Impacts	Little to no residual impact is expected.

4.9.3 Solar Array Construction

Environmental Component Affected	Terrain, Natural Heritage, Watercourses, Archaeological Resources.
Potential Impacts	Sensory disturbance of wildlife and birds due to construction. Increased sedimentation and changes in surface water run-off, natural drainage and altered watercourse flow due to grading changes and soil compaction. Accidental damage to tree limbs or roots during use. Encroachment of wetlands and woodlands. Changes in species composition in wetland and woodland communities due to accidental spills.
Mitigation Measures	No vegetation clearing adjacent between April and August, breeding bird period. Use of perimeter fencing to buffer areas of significance. Standard BMPs for dust control, road construction and erosion control. Site will be re-vegetated after construction using native seed. Standard BMPs for dust control, road construction and erosion control. Develop and implement a spill response plan, identify designated areas for equipment maintenance and fueling, maintain emergency spill-kits onsite. A Stage 3 and 4 archaeological assessment will be undertaken as per the recommendations in the Stage 1 and 2 Report. If a Stage 4 assessment is not completed on certain finds the areas will be protected and appropriately buffered. If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations. Any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.
Residual Impacts	Very little in the way of residual impact is anticipated.

4.9.4 Delivery of Equipment

Environmental Component Affected	Local Public and Traffic Patterns, Natural Heritage, Watercourses.
Potential Impacts	Potential short term traffic delays on local roads to provide room for trucks to deliver project components. Short term increase in truck traffic during construction period.
Mitigation Measures	Delivery of equipment will be coordinated with local traffic patterns. County roads and main local roads will be utilized as much as possible to reduce impact to local residents since these roads are designed for truck traffic and higher traffic volumes. Rail Line will be used for very large loads. A delivery & construction traffic management plan is being submitted with this REA detailed the optimized process and procedure for accessing the site. Area of disturbance will be minimized and mitigated as appropriate through grass seeding.
Residual Impacts	None anticipated.

4.9.5 Installation of Racking System

Environmental Component Affected	Terrain, Unknown Archaeological Resources, Noise (from piles), Groundwater Quality, Natural Heritage, Watercourses.
Potential Impacts	Increased potential for soil erosion due to necessary surficial disturbance by trucks and other heavy equipment used. Increased sedimentation. Encroachment on wetland, woodlands and watercourses. There will be a significant amount of on-site traffic (vehicle and heavy equipment) involved in the construction.
Mitigation Measures	Any area of surficial disturbance will be re-contoured, with stockpiled material removed during excavation, to match original landscape. Areas that define the limits of the work will be staked and marked. Stockpiled material will be stored 30 m from wetland, woodland or watercourse. Equipment movement on-site will be limited to specified travel areas to minimize impacts on land use. Noise and dust control measures will be utilized where required for the construction period. Sedimentation controls will be put in place around stockpiled soils, ditches and disturbed areas within 120 m of a wetland, woodland or watercourse.

	A Stage 3 and 4 archaeological assessment will be undertaken as per the recommendations in the Stage 1 and 2 Report. If a Stage 4 assessment is not completed on certain finds the areas will be protected and appropriately buffered. If during construction any previously undocumented archaeological resources are discovered, work will be immediately suspended in the vicinity of the find and a licensed archaeologist will be contracted to assess the find and make further recommendations. Any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services. Monitoring of groundwater wells will be undertaken before, during and after construction activities, including installation of the support posts and the racking system, to ensure that there are no impacts on groundwater quality as a result of construction.
Residual Impacts	No residual impacts are anticipated, unless unknown archaeological resources are discovered during construction activities.

4.9.6 Solar Panel Assembly and Installation

Environmental Component Affected	Local Residents, Natural Heritage.
Potential Impacts	Noise from construction activities could disturb local residents for the duration of the construction period. Noise for wildlife.
Mitigation Measures	Construction period is of short duration and conducted during regular construction hours to minimize impact on residents living in nearby houses.
Residual Impacts	Solar panel assembly and installation will result in no residual impacts.

4.9.7 Electrical Collector System

Environmental Component Affected	Natural Heritage, Watercourses.
Potential Impacts	Terrain disturbance may occur from trenches between the inverters and the sub-station. Some wildlife and birds may be impacted by noise for a short term due to the use of backhoes used for excavation. Increased sedimentation, loss of riparian vegetation and changes in surface water run-off and natural drainage due to grading changes and soil compaction. Potential for encroachment on wetlands, woodlands and watercourses.
Mitigation Measures	Locating the electrical lines within access road allowances (and array area where the vegetation has been previously disturbed for the road to be constructed and maintained. Sedimentation controls will be put in place around stockpiled soils and disturbed areas within 120 m of a wetland, woodland and watercourse. Use of perimeter fencing to buffer areas of significance.
Residual Impacts	No residual impacts are anticipated.

4.9.8 Substation Construction

Environmental Component Affected	Terrain, Public Safety.
Potential Impacts	Construction of the substation will within the lands previously used by the Nanticoke Generating Station. It will be located on paved or otherwise industrial land and within existing buildings previously used by the generating station. The electrical substation could potentially have public safety issues due to the presence of high-voltage equipment.
Mitigation Measures	To ensure protection of the public, the substation will have a perimeter fence with only authorized personnel wearing proper safety equipment permitted within. All electrical design will meet Ontario Electrical Safety Code requirements.
Residual Impacts	No impacts are anticipated. Substation construction will be done according to all regulatory and safety requirements.

4.9.9 Construction Temporary Power

Environmental Component Affected	Local Public and Public Safety.
Potential Impacts	Provision of Construction Power will be within the industrial land and can be in laydown areas. The electrical step-down transformer could potentially have public safety issues due to the presence of voltage control equipment.
Mitigation Measures	To ensure protection of the public, the transformer will be fenced off, with only authorized personnel wearing proper safety equipment permitted within. All electrical design will meet Ontario Electrical Safety Code requirements.
Residual Impacts	No impacts are anticipated.

5.0 ENVIRONMENTAL EFFECTS MONITORING PLAN

The Environmental Effects Monitoring Plan for construction is presented in the Design and Operations report.