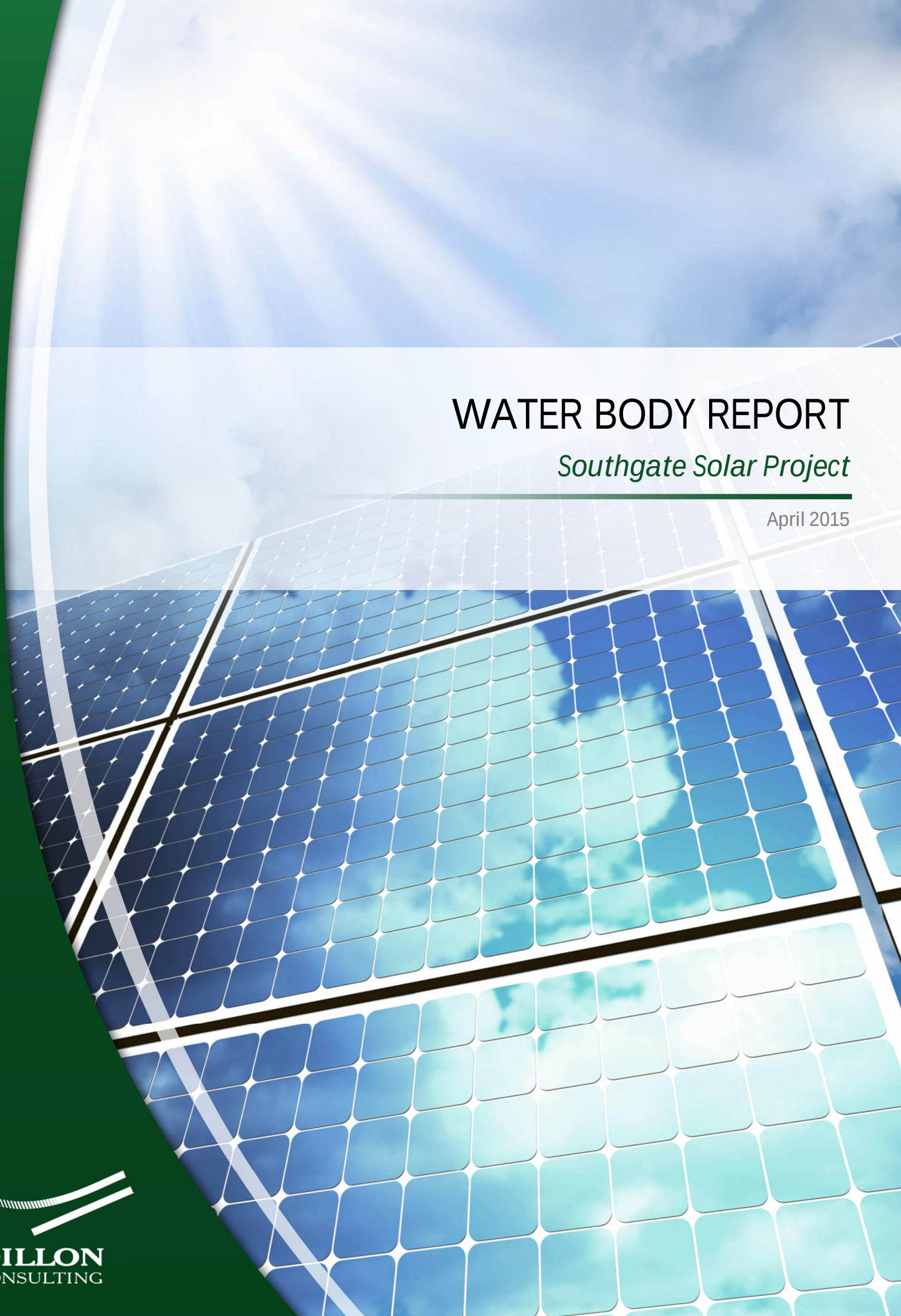
WATER BODY REPORT

Southgate Solar Project

April 2015



DILLON
CONSULTING

Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

Southgate Solar LP proposes to develop a solar facility with a maximum name plate capacity of 50 megawatts alternating current (MWac), located near Mount Forest, in the Township of Southgate, County of Grey, Ontario (Figure 1). The renewable energy facility will be known as the Southgate Solar Project ("the Project").

Southgate Solar LP has initiated the Project through a Power Purchase Agreement (PPA) with the Ontario Power Authority and will require approval under *Ontario Regulation 359/09 (O. Reg. 359/09) – Renewable Energy Approval* (REA) under Part V.0.1 of the *Ontario Environmental Protection Act*.

Ontario Regulation 359/09 requires that all renewable energy projects prepare an Environmental Impact Study (EIS) Report to address any water bodies that have been identified within 120 m of the Project Location (REA Sections 39 and 40). This Water Body Report was completed to address the regulatory requirements for the REA process and is the second and final report in a series that fulfills the requirements of the water body reporting that is required by Ontario Regulation 359/09 as detailed in Table 1. These reports will be submitted to the Ministry of the Environment and Climate Change (MOECC) for review and comment, as required in Ontario Regulation 359/09 and will provide for the protection of water bodies within and adjacent to the Project Location.

Table 1: Checklist for Requirements under O. Reg. 359/09 – Water Assessment – Site Investigation

Required Documentation	Location in Report
1. A site investigation of the land and water located within 120 metres of the Project Location was conducted, either by visiting the site or by an alternative investigation of the site, for the purpose of determining, (a) whether the results of the analysis summarized in the "records review" report are correct or require correction, and identifying any required corrections.	*Water Assessment Report* Section 10, *Summary of Amendments to Records Review*
(b) whether any additional water bodies exist, other than those identified in the records review.	*Water Assessment Report* Section 10, *Summary of Amendments to Records Review*
(c) the boundaries, located within 120 metres of the Project Location, of any water body that was identified in the records review or the site investigation; and	*Water Assessment Report* Section 9, *Site Investigation Results*
(d) the distance from the Project Location to the boundaries determined under clause (c).	*Water Assessment Report* Section 6, *Summary of Records Review;* Section 9, *Site Investigation Results*

Required Documentation	Location in Report
2. If, as a result of the records review, the average annual high water mark of a lake trout lake that is at or above development capacity was identified within 300 metres of the Project Location, an investigation of the land and water located between the Project Location and the lake trout lake was conducted, either by visiting the site or by an alternative investigation of the site, for the purpose of determining: (a) whether the results of the analysis summarized in the "records review" report are correct or require correction, and identifying any required corrections;	N/A
(b) whether any additional water bodies exist, other than those that were identified in the "records review" report;	N/A
(c) the boundaries of any lake trout lake that is at or above development capacity, if, (i) the lake was identified in the records review or the site investigation, and (ii) the boundaries are within 300 metres of the Project Location;	N/A
(d) the boundaries of any water body other than a lake trout lake that is at or above development capacity, if, (i) the water body was identified in the records review or the site investigation, and (ii) the boundaries are within 120 metres of the Project Location; and	N/A
(e) the distance from the Project Location to the boundaries determined under clause (c) and (d).	N/A
3. A report was prepared that sets out the following: (a) A summary of any corrections to the *Records Review* report and the determinations made as a result of conducting the site investigation.	*Water Assessment Report* Section 10, *Summary of Amendments to Records Review*
(b) Information relating to each water body identified in the records review and in the site investigation, including the type of water body, plant and animal composition and the ecosystem of the land and water investigated.	*Water Body Report* Section 9, *Existing Environmental Conditions of Relevant Water Bodies*
(c) A map showing: i. the boundaries mentioned in clause (1) (c) or (2) (c) and (d),	*Water Assessment Report* Figure 4
ii. the location and type of each water body identified in relation to the Project Location, and	*Water Assessment Report* Figure 4
iii. the distances mentioned in clause (1) (d) or (2) (e).	*Water Assessment Report* Figure 4
(d) A summary of methods used to make observations for the purposes of the site investigation.	*Water Assessment Report* Section 8, *Site Investigation Methodology*
(e) The name and qualifications of any person conducting the site investigation.	*Water Assessment Report* Section 8.1, *Names and Qualifications of Site Investigators*

Required Documentation	Location in Report
(f) If the investigation was conducted by visiting the site: i. The dates and times of the beginning and completion of the site investigation.	*Water Assessment Report* Section 8.2, *Site Investigation Dates, Times, Duration, and Weather Conditions*
ii. The duration of the site investigation.	
iii. The weather conditions during the site investigation.	
iv. Field notes kept by the person conducting the site investigation.	*Water Assessment Report* Appendix C
(g) If an alternative investigation of the site was conducted.	*Water Assessment Report* Section 8.3, *Access to Adjacent Lands*
(h) The dates of the generation of the data used in the site investigation:	*Water Assessment Report* Figure 3 *Records Review,* Appendix A *GIS Data Layer Information*
(i) An explanation of why the person who conducted the alternative investigation determined that it was not reasonable to conduct the site investigation by visiting the site.	*Water Assessment Report* Section 8.3, *Access to Adjacent Lands*

SOUTHGATE SOLAR PROJECT

FIGURE 1
GENERAL PROJECT LOCATION

1:500,000

0 2.5 5 10 15 km

N
W E
S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: JP
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\149154 - Samsung Southgate\mxd\Records Review

DILLON CONSULTING

PROJECT: 149154
STATUS: DRAFT
DATE: 9/25/2014

2. THE PROPONENT

In the course of developing renewable energy projects, Southgate Solar LP strives to satisfy various environmental approval requirements and obtains regulatory approvals that vary depending on the jurisdiction, project capacity and site location. In addition, Southgate Solar LP aims to build long-term relationships with the communities that host its projects. Southgate Solar LP is committed to the health and welfare of the residents of the Township of Southgate, and to ensure that the Southgate Solar Project is successful for stakeholders.

Contact information for the Proponent is as follows:

Full Name of Company:	*Southgate Solar LP*
Prime Contacts:	*- Simon Kim, Project Manager* *- A. José De Armas, Manager, Project Development*
Address:	2050 Derry Road West 2nd Floor, Mississauga, ON, L5N 0B9
Telephone:	*1-866-234-7094*
Email:	*ssp@samsungrenewableenergy.ca*

Dillon Consulting Limited is the prime contractor for the preparation of this report. The contact at Dillon is:

Full Name of Company:	*Dillon Consulting Limited*
Prime Contact:	*Michael Enright, Project Manager*
Address:	*1155 North Service Road West, Unit 14, Oakville, Ontario, L6M 3E3*
Telephone:	*(905) 901-2912 ext. 3401*
Email:	*menright@dillon.ca*

3. PROJECT LOCATION

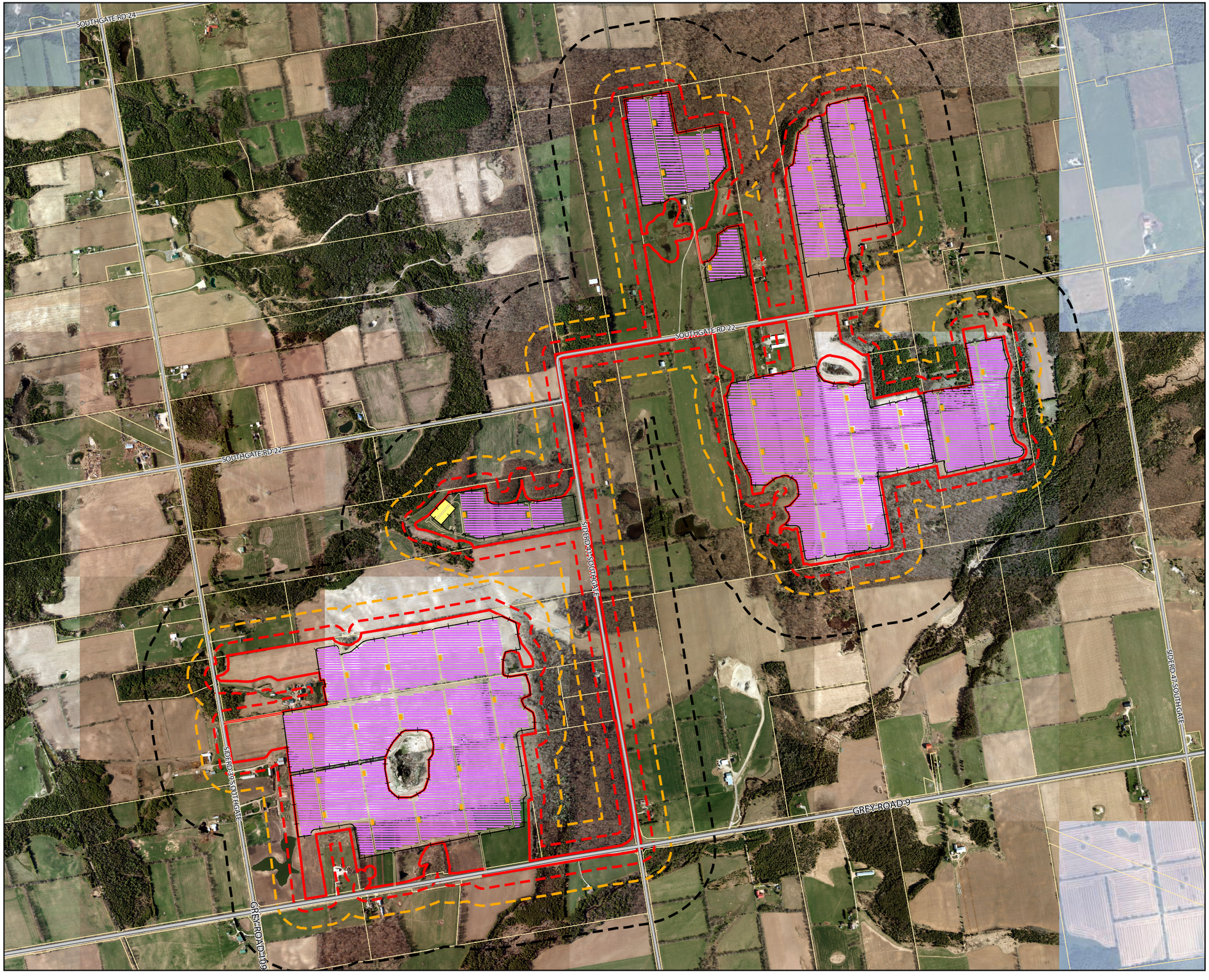
The proposed Class 3 Solar Facility is to be located within the Township of Southgate, in the County of Grey, approximately 11 kilometres north of the community of Mount Forest. The proposed Project Location consists of approximately 235 hectares (581 acres) and is contained within an area bounded in the north by Southgate Road 24, Southgate Road 14 to the south, Southgate 47 to the east and Highway 6 to the west. The proposed Project Location, consisting of multiple privately-owned parcels, is to be leased by Southgate Solar LP. It has an approximate centroid at the following geographic coordinates:

- Latitude: 44° 6' 07.78" N
- Longitude: 80° 44' 49.91" W

Figure 1 shows the general location of the Project in Ontario. The Project Location is defined in *Ontario Regulation 359/09* to be "a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project".

Figure 2 shows the Project Location as defined by *Ontario Regulation 359/09*. Project components, including solar modules and electrical facilities such as Medium Voltage (MV) Stations, main high-voltage (HV) substation transformer and electrical lines, will be located on private land. Areas within the Project Location but outside of the perimeter fence are "Areas of Operational Flexibility". These areas have been reserved to accommodate other Project requirements (*e.g.* stormwater measures, temporary laydown areas, etc.). Figure 2 also includes the 50 m, 120 m and 300 m setbacks from the Project Location. Each setback distance is applicable to various components of the REA process. The 120 m setback is applicable to the *Water Assessment Report*. The 50 m setback is only applicable to the Natural Heritage Assessment for the Project. The 300 m setback is shown in the mapping for reference in the *Construction Plan Report.* Setback development prohibitions for solar facilities are outlined in Part V, Sections 39 and 40 of *Ontario Regulation 359/09* (last amended May 2, 2014). Additional site plans are provided in the *Design and Operations* Report.

Figure 3 identifies natural features and water bodies based on the Water Assessment Site Investigation and the Natural Heritage Assessment, and identifies the required setbacks around these features for the purpose of assessing potential environmental effects.



SOUTHGATE SOLAR PROJECT

FIGURE 2
PROJECT LOCATION

- Fence
- Access Road
- Inverter
- Solar Panel
- Project Location
- Project Location 50 m Setback
- Project Location 120 m Setback
- Project Location 300 m Setback
- Substation
- Parcel Boundary

1:15,000

0 100 200 400 600 m

N
W E
S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: JP
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\149154 - Samsung Southgate\mxd\Records Review

DILLON CONSULTING

PROJECT: 149154
STATUS: DRAFT
DATE: 11/28/2014

4. PROJECT SUMMARY

As shown on Figure 3, a site investigation was completed according to Section 31 of Ontario Regulation 359/09. This work was preceded by a records review as per Section 30 of Ontario Regulation 359/09. A summary of the water bodies within the Project Location and surrounding 120 m, as detailed in the previous Water Assessment Report, is outlined in Table 2.

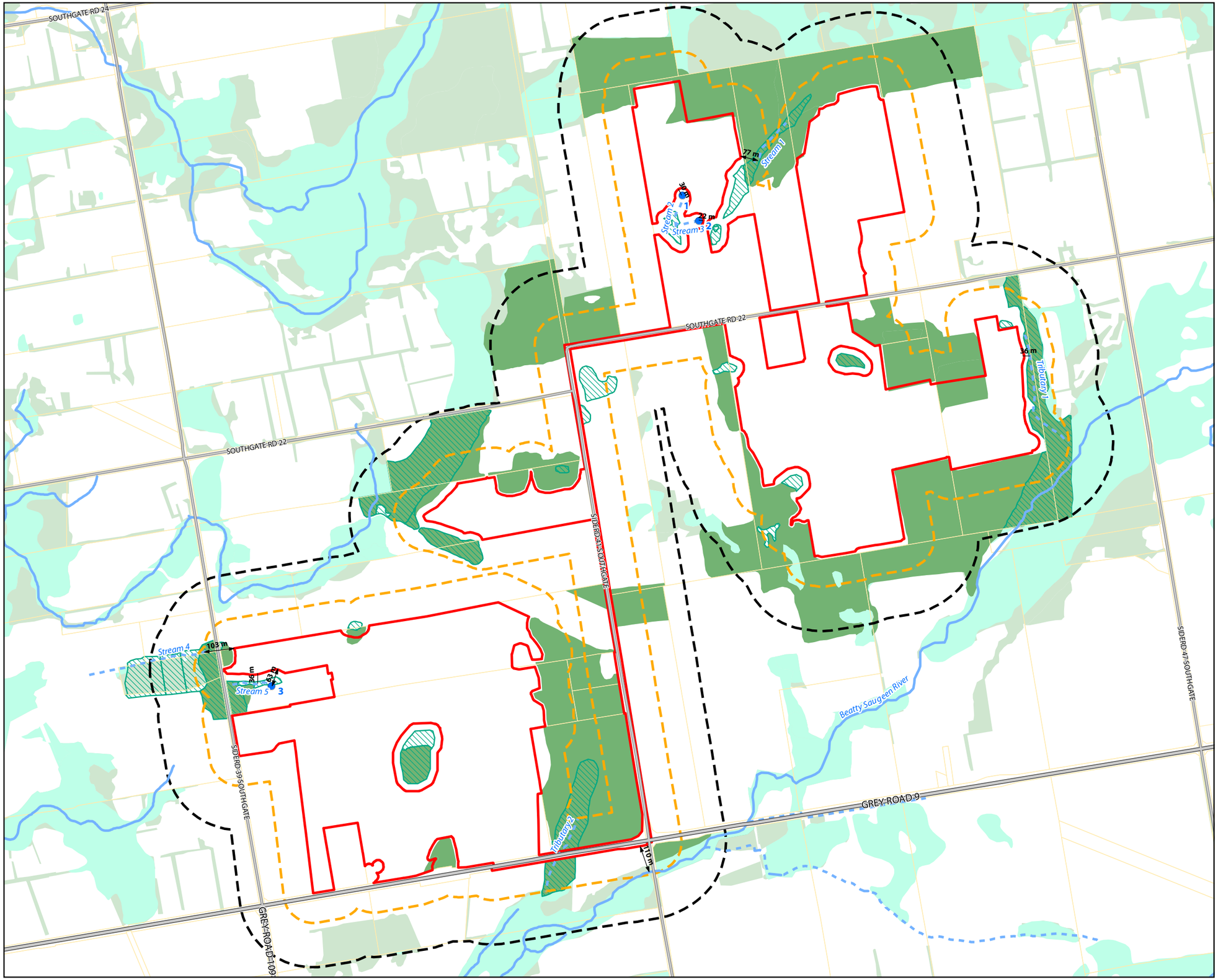
Table 2: Summary of the Water Assessment

Water Body ID	Does the Project location overlap the water body?	Is the Project location within 120m of the water body?	Distance to nearest Project components	Project Components within 120 m of the water body (nearest Project component is listed first).	EIS Required?
Lakes					
None identified within the Project Location or adjacent lands within 300 m					
Lake Trout Lakes					
None identified within the Project Location or adjacent lands within 300 m					
Permanent and/or Intermittent Streams					
Beatty Saugeen River	No	Yes	110 m	▪ Collector Line	Yes
Tributary 1 to the Beatty Saugeen River	No	Yes	36 m	▪ Fence ▪ Solar Panel ▪ Inverter	Yes
Tributary 2 to the Beatty Saugeen River	Yes	Yes	0 m	▪ Collector Line ▪ Area of Operational Flexibility	Yes
Unnamed Stream 1	No	Yes	77 m	▪ Fence ▪ Solar Panel ▪ Access Road	Yes
Unnamed Stream 2	No	Yes	30 m	▪ Fence ▪ Solar Panel ▪ Access Road ▪ Area of Operational Flexibility	Yes
Unnamed Stream 3	No	Yes	22 m	▪ Access Road ▪ Area of Operational Flexibility	Yes
Unnamed Stream 4	No	Yes	103 m	▪ Area of Operational Flexibility	Yes
Unnamed Stream 5	No	Yes	36 m	▪ Area of Operational Flexibility ▪ Access Road ▪ Fence ▪ Solar Panels	Yes

Water Body ID	Does the Project location overlap the water body?	Is the Project location within 120m of the water body?	Distance to nearest Project components	Project Components within 120 m of the water body (nearest Project component is listed first).	EIS Required?
Seepage Areas					
Seepage Area 1	No	Yes	30 m	▪ Fence ▪ Solar Panels ▪ Access Road ▪ Area of Operational Flexibility	Yes
Seepage Area 2	No	Yes	22 m	▪ Access Road ▪ Area of Operational Flexibility	Yes
Seepage Area 3	No	Yes	63 m	▪ Area of Operational Flexibility ▪ Access Road ▪ Fence ▪ Solar Panels	Yes

SOUTHGATE SOLAR PROJECT
WATER BODY REPORT

FIGURE 3
WATER ASSESSMENT
SITE INVESTIGATION



1 Seepage Area
Permanent Stream
Intermittent Stream
Project Location
Project Location 120 m Setback
Project Location 300 m Setback
Parcel Boundary
Dillon Delineated Wetland
Unevaluated Wetland
Dillon Delineated Woodland
Woodland

1:15,000

0 100 200 400 600 m

N
W E
S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR, GREY COUNTY

MAP CREATED BY: GM
MAP CHECKED BY: JP
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\149154 - Samsung Southgate\mxd\Water Body Report

DILLON CONSULTING

PROJECT: 149154
STATUS: DRAFT
DATE: 11/28/2014

5. ENVIRONMENTAL IMPACT STUDY PURPOSE

This EIS Report was completed so that Subsection (1) of Section 40 (Ontario Regulation 359/09), which prohibits construction and development of a renewable facility within 120 m of the average annual high water mark of a water body, does not apply. By completing an EIS Report in accordance with guidelines established by the MOECC, project components may be constructed and installed within 120 m of a water body. This report is consistent with Section 40 of Ontario Regulation 359/09, which details that an EIS Report must include the following:

- Identification and assessment of any negative environmental effects of the Project on a water body and on land within 30 m of the water body;
- Identification of mitigation measures in respect of any negative environmental effects;
- Description of how the environmental effects monitoring plan in the *Design and Operations Report* addresses any negative environmental effects; and,
- Description of how the *Construction Plan Report* addresses any negative environmental effects.

The focus of this Water Body Report will be to fulfill the requirements of Section 40 for the water bodies identified in Table 2 that meet the definition of "water body" under Ontario Regulation 359/09 and are within 120 m of the Project Location.

6. RATIONALE FOR DEVELOPMENT WITHIN A WATER BODY OR SETBACK

The location of the Project has been subject to numerous field investigations, and a thorough review of constraints to development was undertaken prior to delineating the Project Location. Based on the water body information collected, the Project Location was refined to avoid impacts to sensitive water body features, where possible. The layout of the Project has been developed to prioritize the protection of sensitive features and minimize environmental effects where possible.

7. ACCESS TO ADJACENT LANDS

As outlined in Ontario Regulation 359/09, all lands within 120 m of a project component must be assessed to conduct a site investigation of potential water bodies. Often, this can be difficult to achieve when the 120 m setback area is located outside of lands leased for the solar facility. For the Project, some areas of lands near the Project Location were not accessible because permission to access the properties was not granted by the landowners. Water bodies located on adjacent lands where access was not available were assessed from property lines and road rights-of-way, where applicable. This alternative site investigation was conducted in accordance with Ontario Regulation 359/09. For more information, please refer to the *Water Assessment Report*.

8. PROJECT ACTIVITIES

The following subsections outline the Project activities during the construction, operations and decommissioning phases. Table 3 outlines the construction schedule and expected operational date for this Project. It is expected that the Project will remain operational for a period of at least 20 years, after which time its value will be evaluated.

Table 3: Anticipated Duration of Construction Activities

Construction Activity	Estimated Timing
Site Preparation	Q1/2016-Q3/2016
Installation of solar components (structural supports, racking, modules, collection system)	Q1/2016-Q4/2016
Installation of substation and operations and maintenance building	Q2/2016-Q4/2016
Site Clean-up and restoration	Q3/2016-Q4/2016

8.1 Construction

It is anticipated that construction would last approximately 10-12 months. Pending receipt of all necessary approvals and permits, construction is tentatively scheduled to begin in early 2016. Table 4 outlines the anticipated duration of construction activities. Pre-construction activities at the Project Location include: geotechnical study, and archaeological and cultural heritage assessments.

Table 4: Construction Activities

Activity	Description
Survey and Staking of Project Location	Prior to the construction phase, the Project Location will be surveyed and staked to delineate the boundaries for fencing, access roads, excavations and foundation locations. Areas to be avoided will be fenced and/or flagged for public safety.
Clearing, ground levelling and grading	The Project Location will be minimally graded to facilitate construction activities based on a grading plan, and a preliminary Stormwater Management Report (see the *Design and Operations Report*) will be implemented to maintain the pre-construction off-site drainage patterns as much as possible. Selective vegetation clearing may be necessary. If necessary, a detailed design Stormwater Management Plan will be completed by the project contractor prior to the start of construction.

Activity	Description
Drainage and Erosion Control	It is not anticipated that the construction of the Project will have a significant impact on stormwater peak flows at the Project Location. A detailed Stormwater Management Plan will be developed prior to construction to address any temporary and/or permanent systems to manage flow and protect natural features during construction and operations. This detailed plan will be consistent with the preliminary Stormwater Management Report documented as part of the *Design and Operations Report*. Temporary erosion and sediment control measures will be installed prior to and during site construction to protect natural features and other considerations identified in the NHA.
Installation of the perimeter fence and Security Lighting	Fencing will be installed for the duration of the project lifespan around the perimeter of the Project Location. The fence will be installed in accordance with the requirements of the Electrical Safety Authority (ESA) but is anticipated to be a chain-link fence with three strands of barbed wire on top. Alternatively, consideration will also be given to the installation of an anti-climb fence or predator-proof fencing to facilitate potential livestock (sheep) grazing during operations. Gated entrances will be installed at the site entrances. Temporary entrances may be in place during the construction phases. For security and maintenance purposes, lights may be installed near the entrance of the solar facility and task-specific lights will be provided as necessary. During construction, the site will be monitored by the supervising construction staff and if necessary, 24-hour on-site security will also be utilized. Lights will be installed near the main HV substation transformer and site entrances to the solar facility and task-specific lights will be installed where necessary.
Construction of Access Roads and Installation of Temporary Power	The main entrances to the solar facility will be located off Grey Road 9, Southgate Sideroad 41 and Southgate Road 22. Other existing internal access roads will be utilized. In addition, temporary and/or permanent gravel access roads will be constructed to facilitate installation and delivery of equipment as well as maintenance requirements during operations. These granular access roads will be approximately 6 m wide and constructed as appropriate for the Project Location and final engineering design. It is anticipated that geo-textile mats will be installed under all Project access roads to be constructed, to reduce the need for land rehabilitation during decommissioning. During the construction period, it is anticipated that on-site electricity will be obtained from the local distribution utility from nearby suitable distribution lines to provide the Project Location with auxiliary power as required to power equipment and for temporary construction offices, lighting and other purposes. If no distribution supply is available nearby, the requirements for an auxiliary generator will be determined once the layout of the solar facility is reviewed in detail.

Activity	Description
Delineation of Temporary Storage and Construction Areas and Installation of Temporary Facilities	Temporary laydown and construction staging areas will be located within the defined Project Location, as shown on Figure 2. However, pending the final design, any part of the Project Location may be used as temporary storage, which will be dependent on how construction will be staged. These areas will be used for the construction office trailers, portable washrooms, first aid stations, vehicle parking, construction equipment parking, storage sheds, truck unloading/loading, waste disposal pick-up areas, and equipment and material lay-down. After site grading (discussed above) a layer of granular material will be installed to provide an adequate base for construction vehicles, heavy equipment and material laydown. A small portion of the area may be retained to accommodate vehicle parking for maintenance personnel and equipment storage. Additional storage and/or staging areas may be placed in the area between the Project Location boundary and the final fence line (i.e., area of operational flexibility).
Construction of Foundations	Engineered foundations for the MV Stations, main HV substation transformer and the operations and maintenance building will be constructed. The types of foundations will be determined based on the final engineering design, but based on the preliminary geo-technical study, it is anticipated that conventional spread footings will be used.
Installation of Supports, Racking and PV Modules	The Project will consist of approximately 197,000 to 207,000 solar panels of between 290-305 watts (or higher), (DC) each. The panels will be aligned in rows 8 to 12 m apart and will be mounted on 28 – 36 degree fixed tilt ground mounting system. The types of foundations will be determined based on the final engineering design, but it is anticipated that helical screw foundations and/or steel driven piles will most likely be used.

Activity	Description
Installation of Wiring and Inverters/Transformers	The electricity generated by the PV panels will be in the form of direct current (DC). Inverters will be required to convert the DC output of the PV cells into alternative current (AC) suitable for supplying the electrical grid. DC wiring mounted to the back side of the racks is connected to a combiner box. From the combiner box, the DC current will be transmitted below ground to one of up to 63 inverters configured to 793kW. The AC voltage created by the inverters will be "stepped-up" to 34.5 kV through the multiple MV stations. A MV Station houses multiple components, including inverters, and a MV transformer. Approximately 34 MV Stations will be required for the Project. Further details are provided in the *Noise Study Report*. The MV transformer consists of a three-phase high-voltage winding and two separate low-voltage windings each rated for 360 volts. It is anticipated that the inverter used will be an 800 kW model, or similar, and the MV Transformer used will be a 1600 KVA 34.5kV-360/360 V delta HV connection with an ungrounded wye low voltage connection. The AC electrical energy output from the MV Stations will be collected via underground cables and connected to the main HV substation transformer. At the substation, the voltage will be stepped up to 230 kV and connected to the IESO transmission grid. The underground cables will be installed in trenches by a cable trenching machine or dropped in trenches created by an excavator. A tape will be layered above the underground cabling system to serve as a marker, as per ESA standards. After all major construction activities are completed the components will be tested. If any problems or issues arise, remedial corrections and calibration of equipment will be made prior to start-up.
Clean-up of Work Areas	After all major construction activities are completed work areas will be returned to their pre-construction condition or similar. All construction-related waste and excess materials brought to the site will be removed and reused, recycled, or disposed of as applicable by a licensed contractor in accordance with provincial guidelines. Trucks will be used to remove all non-permanent equipment from the Project Location, along with any debris.

Activity	Description
Site Landscaping and Vegetation	Site restoration and reclamation is planned for as much of the Project Location as possible, including along access roads. The restoration and reclamation strategy may include re-contouring of the land to natural drainage patterns (in accordance with a final design Stormwater Management Plan to be prepared prior to construction), management and replacement of subsoil (if applicable) and topsoil and re-vegetation. Disturbed areas may be seeded with a low-growing species such as clover, or allowed to re-vegetate naturally as needed, to help stabilize soil conditions, enhance soil structure and increase soil fertility. Alternatively, the grounds may potentially be grazed by livestock (sheep), thus the disturbed areas may be seeded with pasture grasses. This may occur during several phases of construction, including after grading activities are completed in areas where limited disturbance is anticipated for the remainder of the construction period.

Construction activities will be conducted by licensed contractors in accordance with required standards and codes and all activities will abide by local laws and requirements. Construction-related activities will be conducted within the Project Location boundary outlined in Figure 2. Testing and commissioning of the facility will occur over the last few weeks of construction. During construction, no hazardous materials, including fuel, oils or grease will be stored on site, although equipment may require their use. Disposal of hazardous wastes will only be required in the case of accidental spills and will follow the procedures outlined in the Spills Response Plan. Decisions on waste disposal or recycling during, and immediately after, construction will be made by the on-site contractor who will refer to the *Environmental Protection Act*.

8.2 Operations and Maintenance

The following activities, outlined in Table 5, are associated with the operation and maintenance of the solar facility. These activities will take place over the lifetime of the facility. Overall, few activities are associated with the operational phase of the Project. It will operate year round and generate electricity during daylight hours only and the amount of daily power generated will depend on weather conditions. The proposed solar facility will be monitored and managed remotely; therefore, minimal on-site activity is required for its daily operation and there will be no permanent on-site employees. Security and minor maintenance will be the only regular activities anticipated on-site.

Table 5: Operations and Maintenance Activities

Activity	Description
Monitoring and meter calibrations	The solar facility will be monitored remotely twenty-four hours a day off-site to ensure proper power output and to alert the operations staff to potential issues. Most issues can be remotely diagnosed so that the correct individual(s) can be dispatched to the solar facility to correct any problems or potentially corrected by permanent staff working out of the operations and maintenance building.
Routine periodic maintenance and inspection of project components	Site visits will occur as scheduled to visually inspect the solar facility and Project Location and ensure that the solar facility is in proper working order. Activities that will occur during these visits may include data collection, regular maintenance (as described below) and any necessary minor repairs such as replacement of weathered electrical components. Security visits may also occur periodically. Some of these activities may be undertaken by permanent staff working out of the operations and maintenance building. Transformers, inverters, panels and arrays will be visually inspected during scheduled visits.

Activity	Description
Lighting	For security and maintenance purposes, lighting may be installed near the entrances of the solar facility and task-specific lights will be provided as necessary. These will be appropriately shielded or directed to avoid impacts to neighbours and will be inspected for burned/broken bulbs. Perimeter lighting is not anticipated. Regularly scheduled maintenance will occur.
Cleaning of panels	It is anticipated that the rain would generally be sufficient for cleaning the solar panels; however, depending on the quantity and frequency of rain at the Project Location, the modules may require periodic cleaning. If required, water trucks would bring water to the site. It is not anticipated that chemical detergents will be used to clean panels.
Periodic landscape maintenance	Short native vegetation may be planted once construction activities are complete. It will be necessary to maintain the land in such a way that vegetation does not shade or in other ways impact the solar panels. Regular scheduled maintenance will also occur to manage weed growth as required. There is also potential for maintenance of the vegetation by grazing livestock (sheep), however details of this will be determined during the detailed design stage. This will be done in consideration of any seasonal limitations outlined in the NHA. It is not anticipated that herbicides will be used to manage vegetation.
Major maintenance	Unforeseen, large repairs are not anticipated. Should major maintenance be required it will be performed using existing roads and site access points.
Third party inspections and testing	Activities will be carried out as required by the local utility and other governing bodies in addition to any regularly scheduled inspections and testing.
Traffic	No major deliveries are anticipated for maintenance. Minimal vehicle traffic is associated with regular maintenance.
Drainage and erosion control	If necessary, stormwater runoff at the Project Location will be managed as per a Stormwater Management Plan to be developed by the appropriate contractor at the detailed design stage. This will be done with consideration to maintaining pre-construction drainage patterns and recommendations or limitations outlined in the *Natural Heritage Assessment* or *Water Reports*. Implemented measures will be inspected during routine maintenance reviews.
Waste	The operation of the system does not produce waste. All debris as a result of maintenance or cleaning will be removed from the site immediately by the contractor. An exception is sewage disposal from the washrooms and kitchen facilities, which will be directed to a septic tank designed to building code requirements.

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

8.3 Decommissioning

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

The following activities are associated with the decommissioning of the solar facility. These activities will take place approximately 20 years after commissioning. Decommissioning activities are expected to take between 6-9 months and will occur in the relative order in which they are presented below. More information is provided in the *Decommissioning Plan Report*:

- Disconnection and removal of above and below-ground wiring
- Removal of PV modules, steel/aluminum structures and electrical equipment
- Removal of foundations and any maintenance buildings or other structures
- Removal of access roads
- Topsoil replacement as necessary
- Site grading and rehabilitation as necessary
- Removal of waste from the Project Location

The final decision on waste disposal or recycling will be the responsibility of the on-site contractor who will refer to the *Environmental Protection Act*, or the applicable standards of the day before submitting a Generator Registration Report, or other applicable report, for each type of waste produced at the solar facility. Additional details are provided in the *Decommissioning Plan Report*.

8.3.1 Site Restoration

Once the on-site solar equipment is removed, it is expected that the site will be returned to its former use. Some minor site grading may be required. Site restoration activities will be undertaken with consultation of the landowner.

8.3.2 Managing Excess Materials and Waste

During the decommissioning phase, waste materials will be removed in accordance with applicable local requirements, at a minimum; however the goal will be to recycle all Project materials where possible and to work with local subcontractors and waste firms to segregate

material to be recycled. For example, since the mounting racks are made of manufactured metal, it is anticipated that nearly 100% of the above grade metal structures are salvageable.

9. EXISTING ENVIRONMENTAL CONDITIONS OF RELEVANT WATER BODIES

In total, eight streams and three seepage areas met the definition of a water body under Ontario Regulation 359/09 and within the Project Location and the 120 m setback. The following notes and observations regarding the applicable water bodies were made during a site investigation. For more information, please see the *Water Assessment Report.*

9.1 The Beatty Saugeen River

The Beatty Saugeen River occurs within the 120 m setback area, south of the Project Location. It was observed to be a natural permanent stream. Habitat type was dominantly run morphology with occasional areas of pools and riffles, and with a steady water flow at the time of assessment. Substrates were pre-dominantly cobbles, with occasional boulders, gravel and sand. The mean wetted width was 6.0 m, mean wetted depth was 0.2 m, mean bankfull width was 7.0 and mean bankfull depth was 0.5 m (widths and depths are approximate). The banks showed no significant evidence of erosion or vulnerability to erosion. In-stream cover was pre-dominantly from cobbles and over-hanging vegetation, with sparse cover from boulders, woody debris (both in-stream and over-hanging), and in-stream vegetation, comprised of emergent terrestrial grasses. The stream surface was approximately 30 – 60% shaded by shore cover. No obstructions to fish migration or spawning were observed, and no evidence of groundwater was observed in the assessed area. The riparian vegetation community was forest on the north bank. On the south bank, the riparian vegetation community was scrubland in the 10 m immediately adjacent to the bank, and was meadow further south of the scrubland.

9.2 Tributary 1 to the Beatty Saugeen River

Tributary 1 to the Beatty Saugeen River (hereafter referred to as "Tributary 1") occurs within the 120 m setback area east of the Project Location. It was observed to be a natural intermittent stream within an associated wetland. The habitat type was a flat morphology type near the origin, and transitioned to a run morphology type downstream of the origin. Water flow was steady in the area of run morphology at the time of assessment. Substrates were organic muck and detritus. The mean wetted width was 0.5 m, mean wetted depth was 0.2 m, mean bankfull width was 0.6 m and mean bankfull depth was 0.7 m (widths and depths are approximate).

Stream cover was pre-dominantly from dense in-stream and over-hanging vegetation and woody debris. The stream surface was approximately 60 – 90% shaded by shore cover. The surrounding wetland extended approximately 30 m west of and 50 m east of the stream. Since no other source of surface water was observed flowing into the stream, and since a steady flow of water was observed in the stream, it is likely that water within the surrounding wetland is fed by emerging groundwater. However, no point-source of groundwater seepage was observed in the surrounding wetland.

No obstructions to fish migration or spawning were observed along the assessed portion of the stream. From the west bank, the riparian vegetation community was cedar swamp wetland within 30 m, and was a cultivated hayfield further west. From the east bank, the riparian vegetation community was cedar swamp wetland.

9.3 Tributary 2 to the Beatty Saugeen River

Tributary 2 to the Beatty Saugeen River (hereafter referred to as "Tributary 2") occurs in the Project Location at Grey Road 9. It also occurs in the 120 m setback area that extends north and south of the Project location at Grey Road 9. Within the Project location it crosses under Grey Road 9 where the collector line will connect the various areas of the Project. It was observed to be a natural intermittent stream within an associated wetland. Habitat type was a flat morphology type with minimal observable flow at the time of site investigation. Substrates were pre-dominantly organic detritus over lying gravel and sand. Mean wetted width was 0.2 m, mean wetted depth was 0.1 m, mean bankfull width was 0.3 m and mean bankfull depth was 0.2 m (widths and depths are approximate). The banks showed no significant evidence of erosion or vulnerability to erosion. Stream cover was pre-dominantly from dense in-stream and over-hanging vegetation and woody debris. The vegetation was pre-dominantly aquatic grasses and cattails (*Typha sp*). The stream surface was approximately 90 – 100% shaded by shore cover. The stream crossed under Grey Road 9 via a corrugated steel pipe (CSP) culvert with a diameter of 1.2 m. Water depth in the culvert at its upstream end was approximately 0.05 m, and at its downstream end was approximately 0.1 m. No obstructions to fish migration or spawning were observed along the assessed portion of the stream. The riparian vegetation community surrounding the stream was cedar swamp wetland.

9.4 Unnamed Stream 1

Unnamed Stream 1 (hereafter referred to as "Stream 1") originates in the 120 m setback north of the Project location, within an associated wetland. From its origin, it flows generally south-westward approximately 170 m, then dissipates near the south-western perimeter of the associated wetland, also within the 120 m setback. It was observed to be a natural intermittent stream. Habitat type was a flat morphology type with minimal observable flow at the time of site investigation. Substrates were pre-dominantly organic detritus. The mean wetted width was 0.7 m, mean wetted depth was 0.2 m, mean bankfull width was 0.9 m and mean bankfull depth was 0.3 m (widths and depths are approximate). Stream cover was pre-dominantly from dense over-hanging vegetation, with sparse areas of woody debris. The vegetation was pre-dominantly Touch-me-not species (*Impatiens sp*).

Vegetation in the area where the stream dissipates near the south-western perimeter of the wetland was pre-dominantly Ash species (*Fraxinus sp*). The stream surface was approximately 60 - 90% shaded by shore cover. The riparian vegetation community surrounding the stream was a swamp wetland.

9.5 Unnamed Stream 2

Unnamed Stream 2 (hereafter referred to as "Stream 2") originates in the 120 m setback from a groundwater seepage area (Seepage Area 1). It flows south-westward 10 m into a dugout pond (approximately 40 m wide), empties from the pond over a concrete weir (approximately 1 m wide), continues generally southward 70 m, forms a confluence with Unnamed Stream 3 from the east (see Section 9.6), continues generally southward 60 m, then empties into and dissipates within an area of open shallow water (approximately 30 m x 30 m) and into a meadow marsh wetland. Excluding the in-line dugout pond, Stream 2 was observed to be a natural intermittent stream. Habitat type was a run morphology type with riffles, and with a steady observable flow at the time of site investigation. Substrates were pre-dominantly boulders, cobbles, and gravel, with sparse areas of organic detritus. The mean wetted width was 0.8 m, mean wetted depth was 0.1 m, mean bankfull width was 1.2 m and mean bankfull depth was 0.2 m (widths and depths are approximate). In the portion of the stream upstream of the dugout pond, stream cover was from over-hanging trees. In the portion downstream of the dugout pond, stream cover was from over-hanging grasses and cattails. The stream surface was approximately 30 - 60% shaded by vegetation cover. The dominant riparian vegetation community surrounding the stream was a meadow marsh wetland.

9.6 Unnamed Stream 3

Unnamed Stream 3 (hereafter referred to as "Stream 3") originates in the 120 m setback, from a groundwater seepage area (Seepage Area 2). It is located approximately 120 m southeast of Seepage Area 1 in the same pasture, flows generally westward for approximately 100 m and forms a confluence with Stream 2. Stream 3 was observed to be a natural intermittent stream. Habitat type was pre-dominantly riffle morphology type with a steady flow at the time of site investigation. Substrates were pre-dominantly boulders, cobbles, and gravel, with sparse areas of organic detritus. The mean wetted width was 1.8 m, mean wetted depth was 0.1 m, mean bankfull width was 2.2 m and mean bankfull depth was 0.2 m (widths and depths are approximate). The stream surface was approximately 30 - 60% shaded by vegetation cover; pre-dominantly grasses. The dominant riparian vegetation community surrounding the stream was a meadow marsh wetland.

9.7 Unnamed Stream 4

Unnamed Stream 4 (hereafter referred to as "Stream 4") originates within the 120 m setback, from a dugout pond. It flows generally westward approximately 30 m through a cedar swamp wetland, exits the 120 m setback, continues westward approximately 360 m, then dissipates below the ground surface in an agricultural field. Stream 4 was observed to be a natural intermittent stream. At the origin of the stream (at the point of outflow from the dugout pond), water flow rate and volume was minimal at the time of assessment, and habitat morphology type was flat. As the stream proceeded through the swamp wetland, water flow rate and volume increased and habitat morphology type transitioned to a run. Within the swamp wetland and along the tree row, substrates were pre-dominantly dense boulders and cobbles, mixed with sand, silt and organic detritus. The mean wetted width was 2.4 m, mean wetted depth was 0.1 m, mean bankfull width was 2.8 m and mean bankfull depth was 0.7 m (widths and depths are approximate). Banks were heavily eroded and undercut. Stream cover was pre-dominantly from dense over-hanging vegetation and woody debris. The stream surface was approximately 90 – 100% shaded by shore cover. In the agricultural field, stream cover was less than 30%, the stream flow rate slowed and morphology transitioned to a flat morphology type where the stream dissipated below the ground surface, outside the 300 m setback

9.8 Unnamed Stream 5

Unnamed Stream 5 (hereafter referred to as "Stream 5") originates within the 120 m setback, from a groundwater seepage area (Seepage Area 3) on a residential property. It flows generally westward approximately 180 m through a channelized ditch within the residential property, then dissipates in a wetland located immediately east of Southgate Side Road 39. Stream 5 was observed to be an intermittent stream within a channelized ditch. The habitat type was a run morphology type with steady observable flow at the time of site investigation. Substrates were pre-dominantly gravel and cobbles. The mean wetted width and mean bankfull width was 0.4 m, mean wetted depth was 0.1 m, and mean bankfull depth was 0.2 m (widths and depths are approximate). In the upper south portion of the ditch, the stream banks were lined with concrete railroad ties and the banks showed minimal evidence of erosion or vulnerability to erosion. Stream cover was sparse and was provided by emergent cobbles and occasional over-hanging and in-stream vegetation. Shaded shore cover was less than 30%.

9.9 Seepage Area 1

Seepage Area 1 occurs within the 120 m setback, near the northwest area of the Project Location. It occurs as a point source of groundwater emerging from the ground near a fence line adjacent to a cattle pasture. It is surrounded by a horizontal circular steel cylinder with an approximate diameter of 1 m, set into a substrate base of sand, gravel and organic soil. Groundwater emerges from the substrates and flows from the cylinder, feeding Stream 2 (see Section 9.5).

9.10 Seepage Area 2

Seepage Area 2 occurs within 120 m setback, near the northwest area of the Project Location, approximately 120 m southeast of Seepage Area 1. It occurs as a point source of groundwater emerging from the ground in a cattle pasture. It is surrounded by a horizontal circular steel cylinder with an approximate diameter of 1 m, set into a substrate base of sand, gravel and organic soil. Groundwater emerges from the substrates and flows from the cylinder, feeding Stream 3 (see Section 9.6).

9.11 Seepage Area 3

Seepage Area 3 occurs within the 120 m setback, near the western portion of the Project Location, as a single point source of groundwater emerging from a west-facing hillside on a residential lawn. It is surrounded by a horizontal circular concrete cylinder with an approximate diameter of 1.0 m, set into a substrate base of sand and gravel. Groundwater emerges from the substrates and flows from the cylinder, feeding Stream 5 (see Section 9.8).

10. ENVIRONMENTAL EFFECTS OF THE PROJECT

Project activities relating to site preparation, construction, maintenance, operations, and decommissioning have been reviewed to determine potential negative environmental effects, mitigation and residual effects to the water bodies within the Project Location and surrounding 120 m (see Table 2 and Section 9). These have been outlined in Table 6. In many cases, the Project activities may overlap (*e.g.,* clearing and equipment laydown). Where activities overlap, the activity that is listed first in the Project activity sequence or that has the broadest potential impact is the activity evaluated in Table 6.

As required by Section 39 of Ontario Regulation 359/09, no solar photovoltaic panels or devices and no MV Stations are to be constructed, installed or expanded in a Project Location within 30 m of the average annual high water mark of a permanent or intermittent stream or a seepage area. Other activities, such as fence construction, are permitted if potential negative environmental effects are identified and appropriate mitigation measures are implemented. Therefore, all potential negative environmental effects of the Project outlined in Table 6 are considered to be indirect effects associated with the drainage area for each applicable water body. None of the activities outlined in Table 6 is expected to have any physical or functional effect on a water body provided the appropriate mitigation measures are implemented and maintained.

To address potential effects related to erosion and sediment affecting applicable water bodies, an Erosion and Sediment Control (ESC) plan will be developed and implemented prior to and during construction, to minimize the potential for impairment of the quality of any receiving waters during construction. A detailed ESC plan will not be completed until confirmation of final site grading and layout, phasing of construction, and construction methodology. These items are typically done during detailed design following receipt of the REA. As outlined in the *Stormwater Management Report,* at this preliminary stage, the following recommendations are only for consideration when developing the ESC plan:

- Identifying and protecting trees and plants not shown for removal that are contained within the construction area.
- Installing silt fences (placed at the downslope side of proposed grading activities, proposed stockpile areas, and the site limits) and necessary erosion control measures prior to commencing construction activities.
- Utilize best management practices to reduce the transport of materials (*e.g.* Soil, vegetation, etc.) off site. This may include installing construction entrance (mud mat) at vehicle access points adjacent to paved roads or as otherwise agreed to with the municipality.
- Phasing construction, where possible, to limit areas with and duration exposed soils. Implementing proper dewatering techniques to ensure the site and excavations are free from water. These techniques include diverting water into a dewatering trap with a filter bag on the outlet hose or to a well vegetated area a minimum of 30 m from any sensitive receiving water body/wetland.

- Using appropriate grading techniques to prevent increased run-off potential and maintain positive drainage.
- Utilizing sedimentation basins or sediment traps to treat relatively large drainage areas (*i.e.*, greater than 2 ha).
- Planting of vegetation on disturbed areas after construction activities have ceased (*e.g.* construction laydown area).
- Protecting stockpiled areas with silt fencing and locating the areas a safe distance from sensitive natural features.
- Stabilizing with vegetation or other erosion and sediment control measure disturbed areas that are not under immediate construction (*i.e.*, 30 days).

ESC measures will be designed and implemented in accordance with local guidelines and regulations. Throughout the construction phase of the Project, the ESC plan and individual ESC measures will be evaluated for efficacy and modified as required to meet changing site conditions. Also, proper maintenance and inspection of the temporary erosion and pollution control features is required throughout the duration of the construction phase of the Project. Inspection of all temporary erosion controls is recommended after each significant rainfall event (*i.e.,* greater than 10 mm) and at least daily during prolonged rainfall (*i.e.*, more than 25 mm in a 24 hour period). Accumulated sediment will be cleared when 50% of capacity of the protection is reached. ESC measures will be maintained until growth of vegetation is established in disturbed areas.

Table 6: Potential Environmental Effects of the Project on Water Bodies within 120 m

Activity	Water Body With Potential to be Affected by Activity	Minimum Separation Distance Between Activity and Water Body	Potential Negative Effect(s)	Magnitude of Effect	Frequency of Effect	Duration of Effect	Summary of Mitigation Measures	Residual Effect
SITE PREPARATION, SERVICING AND CONSTRUCTION PHASE								
Vegetation Removal and Grading	Tributary 1	36 m (distance to fence)	▪ Changes in natural surface drainage, including redirection of surface flow and/or increased or decreased surface runoff, which may cause increased or decreased stream flows; ▪ Soil erosion and mobilization resulting in increased sedimentation, turbidity and inputs of nutrients and/or contaminants in adjacent water bodies, which may affect fish habitat (*e.g.*, spawning areas, food sources, benthic composition).	LOW	Single event; temporary during site preparation phase during times of precipitation.	Throughout construction phase until vegetation is established and/or soil is stabilized in the Project Location.	▪ Appropriate grading techniques will be used to prevent increased run-off potential, and to maintain positive drainage. Changes to land contours will be minimized; physical land alterations (*i.e.*, grading, cut and fill, etc.) required will be designed to remain consistent with the pre-existing drainage patterns; ▪ An Erosion and Sediment Control (ESC) plan will be developed for the site and appropriate ESC measures will be used as needed to prevent erosion and soil mobilization. See Section 10 for a list of recommendations considered for inclusion in the ESC plan, which will comprise the necessary mitigation measures. Key ESC measures likely to be used to mitigate the potential negative effects include (but are not limited to): ▪ Identifying and protecting trees and plants not shown for removal that are contained within the construction area; ▪ Maintaining existing riparian vegetation buffers around water bodies. With the exception of Stream 3 and Seepage Area 2, all project components are a minimum of 30 m away from a water body. For Stream 3 and Seepage Area 2, the water bodies are not within 30 m of a solar panel; the closest project component is an access road 22 m from the water body. This is similar to pre-construction conditions as there is a laneway currently in place; and, ▪ Installing silt fences (placed at the downslope side of proposed grading activities, proposed stockpile areas, and the site limits) and all necessary erosion control measures prior to commencing construction activities.	None. Physical land alterations will remain consistent with the pre-existing drainage patterns. ESC plan measures will be maintained where necessary.
	Tributary 2	0 m (distance to collector lines)						
	Stream 1	77 m (distance to fence)						
	Stream 2	30 m (distance to fence)						
	Stream 3	22 m (distance to access road)						
	Stream 5	36 m (distance to area of operational flexibility)						
	Seepage Area 1	30 m (distance to fence)						
	Seepage Area 2	22 m (distance to access road)						
	Seepage Area 3	63 (distance to area of operational flexibility)						

Activity	Water Body With Potential to be Affected by Activity	Minimum Separation Distance Between Activity and Water Body	Potential Negative Effect(s)	Magnitude of Effect	Frequency of Effect	Duration of Effect	Summary of Mitigation Measures	Residual Effect
Construction of Access Roads	Stream 1	106 m (distance to access road)	▪ Decreased surface permeability and redirection of runoff; ▪ Soil erosion and mobilization resulting in increased sedimentation, turbidity and inputs of nutrients and/or contaminants into adjacent water bodies, potentially impacting water quality and fish habitat (*e.g.*, spawning areas, food sources, benthic composition).	LOW	▪ Throughout lifespan of Project (20 years). ▪ Intermittently, during and immediately following precipitation events.	Construction will occur during a timeframe of approximately 4 weeks. Some or all roads will remain in place throughout the lifespan of the facility (20 years), while some may be decommissioned following the construction phase of the Project.	▪ Access roads designed to promote infiltration; ▪ An Erosion and Sediment Control (ESC) plan will be developed for the site and appropriate ESC measures will be used as needed to prevent erosion and soil mobilization. See Section 10 for a list of recommendations considered for inclusion in the ESC plan, which will comprise the necessary mitigation measures. Key ESC measures likely to be used to mitigate the potential negative effects include (but are not limited to): ▪ Maintaining existing riparian vegetation buffers around water bodies. With the exception of Stream 3 and Seepage Area 2, all project components are a minimum of 30 m away from a water body. For Stream 3 and Seepage Area 2, the water bodies are no within 30 m of a solar panel; the closest project component is an access road 22 m from the water body. This is similar to pre—construction conditions as there is a laneway currently in place; and, ▪ Installing silt fences (placed at the downslope side of proposed grading activities, proposed stockpile areas, and the site limits) and all necessary erosion control measures prior to commencing construction activities.	None. Access roads will remain permeable and infiltration will be maintained. ESC plan measures will be maintained where necessary.
	Stream 2	34 m (distance to access road)						
	Stream 3	22 m (distance to access road)						
	Stream 5	91 m (distance to access road)						
	Seepage Area 1	34 m (distance to access road)						
	Seepage Area 2	22 m (distance to access road)						
	Seepage Area 3	91 m (distance to access road)						
Temporary water takings during installation of underground Project components and dewatering of shallow surface excavations	Tributary 1	40 m (distance to solar panel)	▪ Changes to local hydrological regime (groundwater); ▪ Increased surface water from overland dispersal of water, potentially increasing erosion, sedimentation and turbidity to adjacent water bodies.	LOW	Occasionally; only when underground Project components are being installed and either groundwater levels are sufficiently high to require temporary water taking or precipitation events warrant dewatering of shallow surface excavations	During construction phase (10-12 months).	▪ The rate and timing of water pumping will be controlled. Water will be pumped onto vegetated surfaces if possible or into a temporary retention basin, ensuring pumped water re-infiltrates the ground without causing increased run-off or significant changes to local hydrological regime. Temporary water takings will be restricted to less than 50,000 litres per day; ▪ ESC measures will be implemented and monitored as indicated above. Note: Temporary water taking is not anticipated in appreciable volumes for this Project. Temporary water takings activities may be required after significant rainfall events, etc.	None. Hydrological regimes will remain unchanged upon completion of temporary water taking. ESC plan measures will be maintained where necessary.
	Stream 1	82 m (distance to solar panel)						
	Stream 2	38 m (distance to solar panel)						
	Stream 5	120 m (distance to solar panel)						
	Seepage Area 1	38 m (distance to solar panel)						

Activity	Water Body With Potential to be Affected by Activity	Minimum Separation Distance Between Activity and Water Body	Potential Negative Effect(s)	Magnitude of Effect	Frequency of Effect	Duration of Effect	Summary of Mitigation Measures	Residual Effect
	Seepage Area 3	120 m (distance to solar panel)						
Storage and use of construction materials and equipment	Beatty Saugeen River	110 m (distance to collector lines)	▪ Contamination of soil from accidental spills or from equipment and machinery; ▪ Contamination of water bodies with construction materials by surface runoff or wind, potentially impacting water quality and fish habitat; ▪ Contamination of water bodies with construction materials by transport from construction equipment onto paved public roads and subsequent surface runoff or wind, potentially impacting water quality and fish habitat; and, ▪ Movement of equipment and personnel on-site may lead to soil compaction and increased surface water run-off. This could potentially contribute to increased erosion, sedimentation, and turbidity to receiving waters.	LOW	Short-term; only when construction materials and equipment are on site.	During construction phase (10-12 months).	▪ A spill response plan and spill response kits are to be developed and kept on site during construction. ▪ Construction equipment and materials will be primarily stored in temporary construction laydown area(s), protected by silt fencing. No equipment or materials are to be stored within 30 m of a water body; ▪ Utilize best management practices to reduce the transport of materials (*e.g.* Soil, vegetation, etc.) off site. This may include installing construction entrance (mud mat) at vehicle access points adjacent to paved roads or as otherwise agreed to with the municipality; ▪ Following the construction phase and prior to vegetation establishment, areas of soil compaction will be rectified by methods such as scarification, etc.;	None. Construction equipment and excess materials will be removed from site following completion of construction.
	Tributary 1	36 m (distance to fence)						
	Tributary 2	0 m (distance to collector lines)						
	Stream 1	77 m (distance to fence)						
	Stream 2	30 m (distance to fence)						
	Stream 3	22 m (distance to access road)						
	Stream 4	103 m (distance to area of operational flexibility)						
	Stream 5	36 m (distance to area of operational flexibility)						
	Seepage Area 1	30 m (distance to fence)						
	Seepage Area 2	22 m (distance to access road)						

Activity	Water Body With Potential to be Affected by Activity	Minimum Separation Distance Between Activity and Water Body	Potential Negative Effect(s)	Magnitude of Effect	Frequency of Effect	Duration of Effect	Summary of Mitigation Measures	Residual Effect
	Seepage Area 3	63 m (distance to area of operational flexibility)						
OPERATIONS PHASE								
Facility operations	Beatty Saugeen River	110 m (distance to collector line)	▪ Overall decrease in permeability of Project Location caused by the impervious surfaces of some project components, and/or soil compaction from construction activities. A decrease in site permeability and/or an increase in soil compaction may lead to an increase in surface runoff, and potentially contributing to increased erosion, sedimentation, and turbidity to receiving waters.	NONE	Ongoing throughout lifespan of Project (20 years)	Throughout lifespan of Project (20 years).	▪ Each solar panel will be elevated, tilted and mounted to a fixed rack. The area below the panels will be vegetated with low-growing vegetation, either through seeding or natural re-vegetation. Spaces occur between panels mounted on each rack to reduce concentration of run-off from panel table during precipitation events; ▪ Following the construction phase and prior to vegetation establishment, areas of soil compaction will be rectified by methods such as scarification, etc.; ▪ ESC controls will remain in place until soils are stabilized by vegetative growth.	None. Permanent vegetation under the solar panels has the potential to lower the overall runoff coefficient of the site from the existing conditions (*i.e.*, eliminate exposed soils from agricultural operations).
	Tributary 1	40 m (distance to solar panel)						
	Tributary 2	0 m (distance to collector line)						
	Stream 1	82 m (distance to solar panel)						
	Stream 2	38 m (distance to solar panel)						
	Stream 3	22 m (distance to access road)						
	Stream 4	103 m (distance to area of operational flexibility)						
	Stream 5	36 m (distance to area of operational flexibility)						
	Seepage Area 1	30 m (distance to fence)						
	Seepage Area 2	22 m (distance to road)						

Activity	Water Body With Potential to be Affected by Activity	Minimum Separation Distance Between Activity and Water Body	Potential Negative Effect(s)	Magnitude of Effect	Frequency of Effect	Duration of Effect	Summary of Mitigation Measures	Residual Effect
	Seepage Area 3	63 m (distance to area of operational flexibility)						
Accidental spills from transformers (inverters and substation)	Tributary 1	115 m (distance to inverter)	▪ Contamination of soils with transformer fluids by accidental spills, and/or contamination of water bodies from surface runoff of fluids or of contaminated soils, potentially impacting water quality and fish habitat.	LOW	Throughout lifespan of Project (20 years).	Throughout lifespan of Project (20 years).	▪ Transformers are to be located more than 30 m from water bodies; ▪ Spill containment structures will be constructed in association with the transformer substation; ▪ The Emergency Response and Communication Plan will be followed should a spill occur (as outlined in the *Design and Operations Report*); ▪ The MOECC (Spills Action Centre) will be notified in the event of a spill.	None. In the event of a spill from a transformer, the area of the spill will be remediated.
DECOMMISSIONING PHASE								
Removal of above-ground Project components	Beatty Saugeen River	110 m (distance to collector lines)	▪ Increased erosion, sedimentation, and turbidity to receiving water bodies, potentially impacting water quality and fish habitat.	LOW	Short term.	During decommissioning phase.	▪ An erosion and sediment control plan will be developed for the site and installed prior to decommissioning activities.	None.
	Tributary 1	36 m (distance to fence)						
	Tributary 2	0 m (distance to collector lines)						
	Stream 1	77 m (distance to fence)						
	Stream 2	30 m (distance to fence)						
	Stream 3	22 m (distance to access road)						

Activity	Water Body With Potential to be Affected by Activity	Minimum Separation Distance Between Activity and Water Body	Potential Negative Effect(s)	Magnitude of Effect	Frequency of Effect	Duration of Effect	Summary of Mitigation Measures	Residual Effect
	Stream 4	103 m (distance to area of operational flexibility)						
	Stream 5	36 m (distance to area of operational flexibility)						
	Seepage Area 1	30 m (distance to fence)						
	Seepage Area 3	63 m (distance to area of operational flexibility)						
Removal of access roads	Stream 1	106 m (distance to access road)	▪ Increased sedimentation and turbidity in receiving water bodies due to potential temporary changes in surface runoff regimes, potentially impacting water quality and fish habitat.	LOW	During removal of access road.	During decommissioning phase.	▪ An erosion and sediment control plan will be developed for the site and installed prior to decommissioning activities; ▪ Access roads will be graded (at the discretion of the landowner) to match the surrounding landform; ▪ The gravel road base will be removed (at the discretion of the landowner) and replaced with native soils. ▪ Land will be allowed to re-vegetate naturally or will be seeded to stabilize soils (if not part of an agricultural field).	None. Grading will restore any temporarily changed runoff regimes. Native soils and re-vegetation will maintain normal levels of sedimentation and turbidity.
	Stream 2	34 m (distance to access road)						
	Stream 3	22 m (distance to access road)						
	Stream 5	91 m (distance to access road)						
	Seepage Area 1	34 m (distance to access road)						
	Seepage Area 2	22 m (distance to access road)						
	Seepage Area 3	91 m (distance to access road)						

11. ENVIRONMENTAL EFFECTS MONITORING PLAN

The environmental effects monitoring plan (EEMP) prepared for the Project is targeted towards environmental effects that have potential to occur during the construction, design and operation, and decommissioning of the solar facility. The potential negative environmental effects outlined in Table 7 below are specific to the water bodies identified within the Project Location and surrounding 120 m and will form part of the overall EEMP for the Project in the *Design and Operations Report* and the *Construction Plan Report*, as applicable. Table 7 also summarizes the monitoring plan and monitoring frequency during operation of the solar facility, as well as contingency measures that will be undertaken if performance objectives are not achieved.

Table 7: Water Body Environmental Effects Monitoring Plan for the Construction, Operation and Decommissioning of the Southgate Solar Project

Potential Environmental Effect	Affected Water Bodies	Mitigation Strategy	Residual Effects	Performance Objective(s)	Monitoring Plan				Contingency Measures
					Methodology	Monitoring Locations	Frequency/ Duration	Reporting Requirements	
CONSTRUCTION PHASE									
Vegetation clearing and grading may cause changes in natural surface drainage, including redirection of surface flow and/or increased or decreased surface runoff, which may cause increased or decreased stream flows.	Tributary 1 Tributary 2 Stream 1 Stream 2 Stream 3 Stream 5 Seepage Area 1 Seepage Area 2 Seepage Area 3	Appropriate grading techniques will be used to prevent increased run-off potential, and to maintain positive drainage. Changes to land contours will be minimized; physical land alterations (*i.e.*, grading, cut and fill, etc.) required will be designed to remain consistent with the pre-existing drainage patterns.	None. Physical land alterations will remain consistent with the pre-existing drainage patterns.	Maintenance of pre-existing surface drainage.	Visual checks of drainage patterns.	Throughout construction areas.	Checks to occur monthly and/or after rain events greater than 10 mm until grading is complete.	Site records to include record of ESC monitoring during the construction phase. Logs to be provided to the MOECC if requested.	Grading techniques will be adjusted to meet pre-existing drainage outlined in construction design plans.
Vegetation clearing and grading may cause soil erosion and mobilization resulting in increased sedimentation, turbidity and inputs of nutrients and/or contaminants in adjacent water bodies, which may affect fish habitat (*e.g.*, spawning areas, food sources, benthic composition).	Tributary 1 Tributary 2 Stream 1 Stream 2 Stream 3 Stream 5 Seepage Area 1 Seepage Area 2 Seepage Area 3	Mitigation measures from the ESC plan will be implemented, including: ▪ Identifying and protecting all trees and plants not shown for removal that are contained within the construction area; ▪ Maintaining existing riparian vegetation buffers around water bodies; and, ▪ Installing silt fences (placed at the downslope side of proposed grading activities, proposed stockpile areas, and the site limits) and necessary erosion control measures prior to commencing construction activities.	None. ESC plan measures will be maintained where necessary.	Minimization of surface runoff and soil mobilization to receiving water bodies.	Routine visual checks of ESC measures implemented.	At areas where ESC measures are constructed.	Checks to occur monthly and/or after rain events greater than 10 mm until vegetative cover is established.	Site records to include record of ESC monitoring during the construction phase. Logs to be provided to the MOECC if requested.	Breaches to ESC measures will be repaired within 24 hours of identification.

Potential Environmental Effect	Affected Water Bodies	Mitigation Strategy	Residual Effects	Performance Objective(s)	Monitoring Plan				Contingency Measures
					Methodology	Monitoring Locations	Frequency/ Duration	Reporting Requirements	
Construction of access roads and soil compaction may cause decreased surface permeability and redirection of runoff, and/or soil erosion and mobilization resulting in increased sedimentation, turbidity and inputs of nutrients and/or contaminants into adjacent water bodies, potentially impacting water quality and fish habitat (*e.g.*, spawning areas, food sources, benthic composition).	Stream 1 Stream 2 Stream 3 Stream 5 Seepage Area 1 Seepage Area 2 Seepage Area 3	Access roads will be designed to promote infiltration; roadways within the Project Location will be constructed to promote water infiltration. Mitigation measures from the ESC plan may be implemented, including: ▪ Maintaining existing riparian vegetation buffers around water bodies; ▪ Installing silt fences (placed at the downslope side of proposed grading activities, proposed stockpile areas, and the site limits) and all necessary erosion control measures prior to commencing construction activities; ▪ Reduce soil compaction by scarifying land (or by other appropriate means) following the construction phase.	None. Access roads will remain permeable and infiltration will be maintained. ESC plan measures will be maintained where necessary.	Maintenance of surface infiltration and minimization of surface runoff and soil mobilization to receiving water bodies.	Routine checks of surface conditions and ESC measures implemented.	At access roads and areas where ESC measures are constructed.	Checks to occur monthly and/or after rain events greater than 10 mm until vegetative cover is established.	Site records to include record of ESC monitoring during the construction phase. Logs to be provided to the MOECC if requested.	Breaches to ESC controls will be repaired within 24 hours of notification.
Temporary water takings during installation of underground Project components may affect local hydrological regime (groundwater), and overland dispersal of water during temporary water takings may increase surface runoff and increase erosion and sedimentation to adjacent water bodies.	Tributary 1 Stream 1 Stream 2 Stream 5 Seepage Area 1 Seepage Area 3	The rate and timing of water pumping will be controlled. Water will be pumped onto vegetated surfaces if possible or into a temporary retention basin, ensuring pumped water re-infiltrates the ground without causing increased run-off or significant changes to local hydrological regime. Water takings will be restricted to less than 50,000 litres per day. ESC measures will be implemented and monitored as indicated above.	None. ESC measures will mitigate excess overland runoff from temporary water taking activities. No permanent impacts to the water table are anticipated. Water takings are to be <50,000 L/day.	Minimization of impacts to hydrological regime. Maintenance of surface runoff volume.	Ensure discharge of temporary water takings occur into vegetated areas or into a temporary retention basin or filter bag.	Where installation requires temporary water takings.	Once during construction/during installation of Project components.	Site records to include record of locations that required temporary water takings and the volume of water taken each day.	If temporary water takings cause increased soil mobilization or surface run-off in areas of exposed soil, temporary water taking activities will be stopped until additional ESC measures can be implemented. If water taking needs to exceed 50,000 L/day, the MOECC will be consulted.

Potential Environmental Effect	Affected Water Bodies	Mitigation Strategy	Residual Effects	Performance Objective(s)	Monitoring Plan				Contingency Measures
					Methodology	Monitoring Locations	Frequency/ Duration	Reporting Requirements	
Storage and use of construction materials and equipment may cause contamination of soils and/or water bodies from accidental spills, from surface runoff, from wind, or from the transport of materials by equipment and machinery onto paved public roads and subsequent surface runoff or wind.	Beatty Saugeen River Tributary 1 Tributary 2 Stream 1 Stream 2 Stream 4 Stream 3 Stream 5 Seepage Area 1 Seepage Area 2 Seepage Area 3	Construction equipment and materials will be primarily stored in construction laydown area(s), protected by silt fencing. No equipment or materials will be stored within 30 m of a water body. Utilize best management practices to reduce the transport of materials (*e.g.* Soil, vegetation, etc.) off site. This may include installing construction entrance (mud mat) at vehicle access points adjacent to paved roads or as otherwise agreed to with the municipality	None. Construction equipment and excess materials will be removed from site and municipal roads following completion of construction.	▪ Ensure equipment and materials are stored more than 30 m from a water body, with surrounding silt fencing; ▪ Ensure mud mats are in place and preventing off-site transport; ▪ Ensure any materials transported off-site are washed away from water bodies; ▪ Keep public roads clear of construction debris.	Routine checks of equipment and machinery storage, mats and municipal roads.	Main facility entrance points (on Grey Road 9, Side Road 39 Southgate, Side Road 41 Southgate, and Southgate Road 22) and in the construction laydown areas.	Regularly, during the construction phase.	Site records to include details of equipment and material storage and use of public roads.	If soil is mobilized onto paved public roads by equipment, clearing activities to avoid moving soil into nearby water bodies
OPERATIONS PHASE									
Facility operations may cause an overall decrease in permeability of Project Location due to the impervious surfaces of the solar panels and/or soil compaction from construction activities. A decrease in site permeability may lead to an increase in surface runoff, potentially contributing to increased erosion, sedimentation, and turbidity to receiving waters.	Beatty Saugeen River Tributary 1 Tributary 2 Stream 1 Stream 2 Stream 3 Stream 4 Stream 5 Seepage Area 1 Seepage Area 2 Seepage Area 3	Each solar panel will be elevated, tilted and mounted to a rack. The area below the panels will be vegetated with low-growing vegetation, either through seeding or natural re-vegetation. Following the construction phase and prior to vegetation establishment, areas of soil compaction will be rectified by methods such as scarification, etc. ESC controls will remain in place until soils are stabilized by vegetative growth.	None. The vegetation on-site will prevent the mobilization of sediment and surface runoff.	Re-establishment of vegetation providing minimization of surface runoff and soil mobilization to receiving water bodies.	Visual check of the Project Location to ensure re-vegetation of lands occurs.	Throughout the Project Location.	Weekly during growing season (May 1 to August 30) until evidence of growth is observed, then monthly until all areas are vegetated or re-vegetated.	Photo documentation will be collected showing soil stabilization and maintenance of previous conditions through vegetation establishment. ESC logs will be maintained until vegetative cover is established.	If the performance measures are not met, areas with no growth will be vegetated using a native seed mix. ESC measures will be implemented and maintained until vegetation is observed to be established and thriving.

Potential Environmental Effect	Affected Water Bodies	Mitigation Strategy	Residual Effects	Performance Objective(s)	Monitoring Plan				Contingency Measures
					Methodology	Monitoring Locations	Frequency/ Duration	Reporting Requirements	
Operations may cause contamination of soils with transformer fluids by accidental spills, and/or contamination of water bodies from surface runoff of fluids or of contaminated soils, potentially impacting water quality and fish habitat.	Tributary 1	Transformers are to be located more than 30 m from water bodies. Spill containment structures will be constructed in association with the transformer substation. The Emergency Response and Communication Plan will be followed should a spill occur (as outlined in the Design and Operations Report). The MOECC (Spills Action Centre) will be notified in the event of a spill.	None. In the event of a spill from a transformer, the area of the spill will be remediated.	Avoidance of deleterious materials entering a water body.	Routine checks of transformers to ensure appropriate working order.	Transformer locations (inverters and substation)	Throughout Project lifespan.	Site maintenance records to be kept for all transformers	The Emergency Response and Communication Plan will be followed should a spill occur (as outlined in the Design and Operations Report). Notification of MOECC (Spills Action Centre) in the event of a spill.
DECOMMISSIONING PHASE									
Removal of above-ground Project components may cause increased erosion, sedimentation, and turbidity to receiving water bodies, potentially impacting water quality and fish habitat.	Beatty Saugeen River Tributary 1 Tributary 2 Stream 1 Stream 2 Stream 4 Stream 5 Seepage Area 1 Seepage Area 3	An erosion and sediment control plan will be developed for the site and implemented prior to decommissioning activities.	None. Decommissioned Project components will be removed and the Project Location restored to its original or better condition.	Minimization of surface runoff and soil mobilization to receiving water bodies.	Routine checks of ESC measures implemented during decommissioning phase. Routine monitoring to ensure exposed soils are permanently stabilized (unless land is returned to agricultural operations).	Areas where ESC measures are implemented	Monthly and/or after rain events greater than 10 mm until vegetative cover is established (if required).	Site records to include record of ESC monitoring during the decommissioning phase.	If it is determined during the routine checks, that ESC measures are not sufficient, work will stop until appropriate ESC measures can be established. If exposed soil shows signs of mobilization, appropriate corrective actions will be taken to prevent entry of soil into a water body.

Potential Environmental Effect	Affected Water Bodies	Mitigation Strategy	Residual Effects	Performance Objective(s)	Monitoring Plan				Contingency Measures
					Methodology	Monitoring Locations	Frequency/ Duration	Reporting Requirements	
Removal of access roads may cause increased sedimentation and turbidity in receiving water bodies due to potential temporary changes in surface runoff regimes, potentially impacting water quality and fish habitat.	Stream 1 Stream 2 Stream 3 Stream 5 Seepage Area 1 Seepage Area 2 Seepage Area 3	An erosion and sediment control plan will be developed for the site and installed prior to decommissioning activities. Access roads will be graded (at the discretion of the landowner) to match the surrounding landform. The gravel road base will be removed (at the discretion of the landowner) and replaced with native soils. Land will be allowed to re-vegetate naturally or will be seeded to stabilize soils.	None. Grading will restore any temporarily changed runoff regimes. Native soils and re-vegetation will maintain normal levels of sedimentation and turbidity.	Minimization of surface runoff and soil mobilization to receiving water bodies. Restoration of surface runoff regimes.	Routine checks of ESC measures implemented during decommissioning phase. Visual checks of runoff patterns.	Areas where ESC measures are implemented and along access roads.	Regular intervals and/or after rain events greater than 10 mm until vegetative cover is established (if required).	Site records to include record of ESC monitoring during the decommissioning phase.	If it is determined during the routine checks, that ESC measures are not sufficient, work will stop until appropriate ESC measures can be established. If exposed soil shows signs of mobilization, appropriate corrective actions will be taken to prevent entry of soil into a water body.

12. NEGATIVE ENVIRONMENTAL EFFECTS, DESIGN AND OPERATIONS

As required, an environmental effects monitoring plan (EEMP) has been prepared for inclusion in the *Design and Operations Report*. The potential negative environmental effects to water bodies within 120 m of the Project Location, as outlined in Table 7, will be negligible after mitigation measures are implemented. Upon the completion of construction, the exposed soil in the Project Location will be stabilized in consultation with landowners. This conversion of exposed agriculture land to vegetated solar facility will result in a marginally lower overall runoff coefficient for the Project Location (see the Stormwater Management Report in Appendix A of the *Construction Plan Report*).

Table 7 also summarizes the monitoring plan and monitoring frequency during the design and operation of the solar facility until the vegetation surrounding the Project components is established. Contingency measures that will be undertaken if performance objectives are not achieved are also included. Additional mitigation measures proposed to minimize impacts of the solar facility and not related to water bodies are summarized in the *Design and Operations Report*.

13. NEGATIVE ENVIRONMENTAL EFFECTS, CONSTRUCTION

As required in Ontario Regulation 359/09, the *Construction Plan Report* will include the information in Table 6 and Table 7 of this Water Body Report to address any negative environmental effects anticipated on water bodies within 300 m of the Project Location during the construction phase of the Project. The potential negative environmental effects to water bodies within 300 m of the Project Location, as outlined in Table 7, will be negligible after mitigation measures are implemented. During construction of the Project, appropriate erosion and sediment control measures will be implemented (see the *Construction Plan Report*).

Table 7 also summarizes the monitoring plan and monitoring frequency during the construction of the solar facility. Contingency measures that will be undertaken if performance objectives are not achieved are also included. Additional mitigation measures proposed to minimize impacts of the solar facility and not related to water bodies are summarized in the *Construction Plan Report*.

14. ADDITIONAL APPROVALS AND PERMIT REQUIREMENTS

Permitting or approvals that may be required for work within or adjacent to water bodies will be obtained in a parallel process (as applicable) with the Renewable Energy Approval submission and review. Possible permitting requirements for the water crossing include, but are not limited to, authorizations from the *Lakes and River Improvement Act*, the *Conservation Authorities Act,* the *Fisheries Act*, and the *Drainage Act*.

15. CONCLUSIONS

Through a records review and site investigation, it was determined that eleven water bodies exist within the Project Location or 120 m prescribed setback area (Figure 3). As such, a Water Body Report was required under Section 39 and 40 of Ontario Regulation 359/09. This second and final report therefore satisfies the requirements under Ontario Regulation 359/09 with respect to water bodies.

This Water Body Report was completed to mitigate any potential negative environmental effects to the following water bodies (see Figure 3):

- The Beatty Saugeen River
- Tributary 1 to the Beatty Saugeen River
- Tributary 2 to the Beatty Saugeen River
- Unnamed Stream 1
- Unnamed Stream 2
- Unnamed Stream 3
- Unnamed Stream 4
- Unnamed Stream 5
- Seepage Area 1
- Seepage Area 2
- Seepage Area 3

Table 7 outlines how the activities related to the construction, operation and decommissioning of the solar facility may affect these water bodies and the appropriate mitigation and monitoring work to be implemented. This information is also included in the *Construction Plan Report* and the *Design and Operations Report* as required.