KINGSTON SOLAR LP
Sol-Luce Kingston Solar PV Energy Project

Water Addendum

Prepared by Dillon Consulting Limited

November 25, 2013

Project # 138532

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1. Introduction

Kingston Solar LP proposes to develop a ground-mount solar facility with a name plate capacity of 100 MW (AC). The proposed project falls within two (2) municipalities; the City of Kingston to the east and Loyalist Township to the west (Figure 1). The renewable energy facility will be known as Sol-Luce Kingston Solar PV Energy Project (the Project) and will be rated as a Class 3 solar facility. Kingston Solar LP has received a contract from the Ontario Power Authority (OPA) for the purchase of electricity generated by this renewable energy facility through the Province's Feed-in-Tariff (FIT) program (enabled by the *Green Energy and Green Economy Act)*. The project is seeking approval under *Ontario Regulation 359/09 – Renewable Energy Approval* (*REA* or *Ontario Regulation 359/09*) under Section V.0.1 of the *Ontario Environmental Protection Act.*

The Renewable Energy Approval (REA) application was originally submitted for this project on September 18, 2012 and received the 'deemed complete' status by the Ministry of the Environment (MOE) on February 12, 2013. The project was undergoing technical review by the MOE when the review was stopped to accommodate an amendment for the project.

In general, the amendment removed some properties originally proposed for development and included the addition of new sites. The nature of this amendment therefore necessitates further consideration to be given to potential water bodies associated with the amended project location and requires a Water Addendum Report to be drafted. This Water Addendum Report is to be read in tandem with the original Water Assessment and Water Body Report prepared by AMEC (September 2012) and submitted to the MOE for review on September 18, 2012.

Figure 1: General Location of Sol-Luce Kingston Solar PV Energy Project in Ontario

2. The Proponent

In the course of developing renewable energy projects, Kingston 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, Kingston Solar LP aims to build long-term relationships with the communities that host its projects. Kingston Solar LP is committed to the health and welfare of the residents of the City of Kingston and Loyalist Township, and to ensuring that Kingston Sol-Luce PV Solar Project is successful for stakeholders.

Contact information for the Proponent is as follows:

Full Name of Company:	*Kingston Solar LP*
Address:	*55 Standish Court, 9th Floor, Mississauga, Ontario, L5R 4B2*
Telephone:	*(905) 501-5658* *1-(800) 359-2342*
Prime Contact:	*A. José De Armas*
Email:	*solucekingston@samsungrenewableenergy.ca*

3. Project Location

The proposed Class 3 solar facility is located at several addresses along Unity Road and Mud Lake Road near the City of Kingston in Loyalist Township. Overall, the project location is bounded by Quabbin Road to the north, Mud Lake Road/County Road 19 to the west, Highway 401 to the south, and Highway 38 to the east and is located within the municipal boundaries of the City of Kingston and Loyalist Township. Figure 1 shows the general location of the project. The planned solar facility will occur primarily within lands currently zoned as "rural area" (City of Kingston Official Plan) and "rural" (Loyalist Township Official Plan).

Figure 2 shows the entire project location (as defined in *Ontario Regulation 359/09* to be the location encompassing all projects components) and distinguishes between the previously studied lands that were included in the original Water Body and Water Assessment Report and the amended project location. All project components, including solar modules and electrical facilities such as inverters, transformers, substations and electrical lines, will be located on private land or municipal rights-of-way. Specifically, a 34.5 kV collector system of underground and/or overhead power lines and fibre optic cabling will transport outgoing power along access roads on PV array sites and the municipal road allowance to the transformer (substation) or the adjacent switch yard. The substation will act as the connecting point that will ultimately bring the power generated to the Hydro One transmission line.

This addendum report solely focuses on the new lands added to the project location (see Figure 2) as part of the recent revisions made in response to stakeholder consultation (see REA Modification Document for more information). Amendments to the original Water Assessment and Water Body Report (AMEC 2012) are outlined in the Water Modifications Document that will form part of the REA Modifications Document (Dillon 2013).

The three properties added to the Sol-Luce Kingston Solar PV Energy Project that are the focus of this Water Addendum Report are: Site 2, 25a, and 25b (Figure 2). Within the City of Kingston, Site 2 is north of Rock Road and is to the south of the area previously indicated for development; Sites 25a and 25b are located on the north side of Unity Road, approximately 2.2 km east of Quabbin Road.

Sol-luce Kingston Solar PV Energy Project

Figure 2
Project Location

Area of Addendum

Site 25b & 25a

Site 2

CITY OF KINGSTON

TOWNSHIP OF LOYALIST

SIMMONS ROAD

FLORIDA ROAD

CHIPMUNK RIDGE ROAD

QUABBIN ROAD

RAYMOND ROAD

VAN ORDER ROAD

HIGHWAY 38

ROCK ROAD

UNITY ROAD

SMITH ROAD

WESTBROOK ROAD

COUNTY ROAD 19

HEGADORN ROAD

HOWES ROAD

BUR BROOK ROAD WEST

RADAGE ROAD

KERNS ROAD

GENGE ROAD

BRULE ROAD

NEILROAD

SHANE STREET

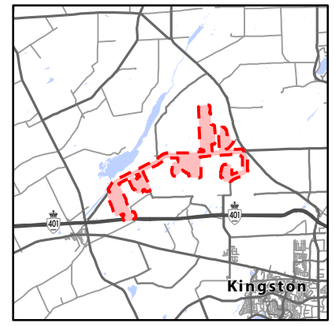
401

Legend

- Freeway
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Project Location
- Amended Project Location
- 120 m Project Location Setback
- 300 m Project Location Setback
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback
- Municipal Boundary

Project Components

- Solar Panels
- Inverters
- Access Road
- Fence
- Substation



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4. Water Body Records Review

Ontario Regulation 359/09 requires that all renewable energy projects conduct a records review and site investigation for water bodies that fall within the project location or the prescribed setback area (*REA* Section 29). A records review was completed, consistent with Section 30 of *Ontario Regulation 359/09*, for the amended project location (see Figure 2) using secondary source information.

Section 30 of *Ontario Regulation 359/09* states a water body assessment for a renewable energy facility includes a records review to search for and determine whether the project location is:

1. In a water body;
2. Within 120 metres of the average annual high water mark of a lake, other than a Lake Trout lake that is at or above development capacity;
3. Within 300 metres of the average annual high water mark of a Lake Trout lake that is at or above development capacity;
4. Within 120 metres of the average annual high water mark of a permanent or intermittent stream; or
5. Within 120 metres of a seepage area.

Under *Ontario Regulation 359/09*, the definition of a water body includes lakes, permanent and intermittent streams and seepage areas, but does not include:

a) Grassed waterways;
b) Temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through;
c) Rock chutes and spillways;
d) Roadside ditches that do not contain a permanent or intermittent stream;
e) Temporary ponded areas that are normally farmed;
f) Dugout ponds; or,
g) Artificial bodies of water intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and site and outdoor confinement areas.

4.1 Records Review Methodology

Table 1 outlines the secondary sources of information used to conduct the water body records review. For the purposes of this Water Addendum Report the original project Water Assessment and Water Body Report (AMEC 2012) was not used as a background reference.

Table 1: Records and Resources Search and Analyzed During Records Review

Record Source		Records Requested and/or Reviewed
Ministry of Natural Resources		
District Office: Peterborough District		Contact: [Joe Halloran, Renewable Energy Coordinator, Southern Region], via email ▪ Records relating to natural features, water bodies and wildlife species
Date of Request: November 4, 2013	Date of Data Receipt: No new information to be provided	
Manuals/Guidelines		Natural Heritage Reference Manual, Second Edition, March 2010
Land Information Ontario, data requested/accessed October 2013		▪ Interactive Online Mapping Tool ▪ Data Layer Information is provided in Appendix A
Ontario Crown Land Use Policy Atlas, online data accessed October 2013		• Used to identify Crown land in Ontario
Federal Government		
Centre for Topographic Information		▪ Online mapping tool accessed November 2013
Conservation Authority		
Cataraqui Region Conservation Authority		Contact: Michael Dakin, Resource Planner, via email ▪ Records relating to natural features, water bodies and wildlife species ▪ Relevant studies undertaken in area of project location
Date of Request: October 23, 2013	Date of Data Receipt: No new records	
Municipality		
Upper-Tier Municipality: City of Kingston		▪ Official Plan and mapping Schedules reviewed ▪ Consultation materials as provided in original REA submission
Lower-Tier Municipality: Loyalist Township County of Lennox and Addington		▪ Official Plan and mapping Schedules reviewed ▪ Consultation materials as provided in original REA submission

Record Source	Records Requested and/or Reviewed
Planning Authorities and Local Boards	
Municipal Planning Authority	Not applicable in project location
Local Planning Board	Not applicable in project location
Local Roads Board	Not applicable in project location
Local Services Board	Not applicable in project location
Other Resources	
Distribution of Fish and Mussel Species at Risk Mapping for CRCA	Fisheries and Oceans Canada (2013) mapping of occurrences of federally listed *Endangered*, *Threatened* and *Special Concern* fish and mussel species
Great Lakes Conservation Blueprint for Aquatic Biodiversity. Volume 2: Tertiary Watershed Summaries	Phair *et al.* 2005. Produced by the Nature Conservancy of Canada ▪ Summary of statistics and land use relating to water bodies in each ecodistrict
Central Cataraqui Region Natural Heritage Study	Accessed to determine presence of water bodies.
Provincial Plan Area Records	
Niagara Escarpment Commission	Project location does not fall within the Niagara Escarpment Plan Area
Oak Ridges Conservation Plan Area	Project location does not fall within the Oak Ridges Conservation Plan Area
Greenbelt Plan Area	Project location does not fall within the Greenbelt Plan Area
Lake Simcoe Protection Plan	Project location does not fall within the Lake Simcoe Protection Plan Area

4.2 Records Review Results

The project location falls within the Napanee Tertiary Watershed 2HM, which drains approximately 304 000 hectares of land into northeastern Lake Ontario. This watershed straddles the divide of the Canadian Shield and the Paleozoic limestone bedrock of southern Ontario. The natural cover in this watershed is dominated by mixed deciduous and coniferous forests, with approximately 13% of the watershed comprised of wetland systems. The southern portion of the watershed where the project location occurs is dominated by agriculture. Approximately 80% of the watershed is made up of stream systems and less than 3.4% is comprised of lake systems (Phair *et al.*, 2005).

As stated in Section 3.0, the project location is located within the municipal boundaries of the City of Kingston and Loyalist Township (County of Lennox and Addington). Both municipalities have identified the areas of the project location as "rural area".

4.2.1 Water Bodies

Based on our review and analysis of the records and resources outlined in Table 1, and in accordance with *Ontario Regulation 359/09*, determinations were made whether the amended project location is in a water body or within 120 metres of the average annual high water mark of a water body (see Figure 3). All mapping used for the Records Review is based on agency data (see Appendix A) and is not necessarily reflective of site conditions. In consideration of potential Lake Trout lakes, water bodies within 300 metres are also noted.

4.2.1.1 Average Annual High Water Mark Determination

For the purposes of this *REA* reporting, the average annual high water mark for streams means the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters, this refers to the "active channel/ bankfull level" which is often the one-to two-year flood flow return level (MOE 2013). For inland lakes, it refers to those parts of the water body bed and banks that are frequently flooded by water (MOE 2013).

4.2.2 Lakes

A search and analysis of the records and resources outlined in Table 1 did not identify any named lakes in the amended project location or within the surrounding 300 metres. Within 120 metres of the amended project location, two open water areas are mapped and will be investigated further during the site investigation to determine if they meet the definition of a water body.

Sol-luce Kingston Solar PV Energy Project

Figure 3 Water Body Records Review

QUABBIN ROAD

VAN ORDER ROAD

HIGHWAY 38

Site
25b & 25a

Site
2

B

A

GC Trib 2b-i

GC Trib 2b

ROCK ROAD

Glenvale Creek

UNITY ROAD

SMITH ROAD

WESTBROOK ROAD

Legend

- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Potential Stream
- Fence Line
- Project Location
- Amended Project Location
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback
- A Potential Water Body
- Unevaluated Wetland
- Woodland (MNR)

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4.2.3 Lake Trout Lakes

As discussed above, a search and analysis of the records and resources outlined in Table 1 did not identify any lakes, including Lake Trout lakes under management by the MNR, in the amended project location or within the surrounding 300 metres.

4.2.4 Permanent and/or Intermittent Streams

A search and analysis of the records and resources outlined in Table 1 identified two unevaluated streams within the western 120 metre setback of Site 25b (Figure 3) in the amended project location. Both potential water bodies are tributaries of Glenvale Creek.

A review of publicly available information sources did not provide any further baseline information related to the project location and applicable to this report.

4.2.5 Seepage Areas

A search and analysis of the records and resources outlined in Table 1 did not identify any seepage areas, as defined by *Ontario Regulation 359/09*, in the amended project location or within the surrounding 120 metres.

4.3 Other Considerations Related to Water Bodies

4.3.1 Aquatic Species at Risk

Species at Risk listed under the federal *Species at Risk Act* and provincial *Endangered Species Act, 2007*, with the potential to interact with the project location and/or adjacent lands, are being considered in consultation with the appropriate agency. Reporting related to the protection of Species at Risk will be provided to the appropriate agency under separate cover as required. This reporting format meets the requirements as set out in *Ontario Regulation 359/09*, and is consistent with the direction provided by the MNR and the MOE.

4.3.2 Provincial Plan Areas

Under *Ontario Regulation 359/09*, if any part of the project location falls within a provincial plan area the project may be subject to different criterion to evaluate the applicable water bodies. In addition, should development occur within the prescribed setback area of a water

body, it may be subject to a different set of prohibitions under *Ontario Regulation 359/09*. Table 2 outlines the provincial plan areas that should be considered when planning a renewable energy project and identifies which, if any, are applicable to the amended project location.

Table 2: Summary of Provincial Plan Areas and Applicability to the Project Location

Provincial Plan Area	Applicability to Project
Niagara Escarpment Commission	None
Oak Ridges Moraine Conservation Plan Area	None
Niagara Escarpment Plan Area	None
Greenbelt - Natural Heritage System	None
Greenbelt – Protected Countryside	None
Lake Simcoe Protection Plan	None

4.3.3 Regulated Areas

Under the *Conservation Authorities Act*, the Cataraqui Region Conservation Authority (CRCA) is responsible for the application and enforcement of the *Regulation of Development, Interference with Wetlands and Alterations to Shoreline and Watercourses* that was approved and then filed on May 4, 2006 (*Ontario Regulation 148/06*). Regulated Areas are lands in proximity to hazardous lands, wetlands and areas susceptible to flooding. Development within these Regulated Areas may require a permit. The CRCA has mapped regulated areas within the project location and setback areas. Kingston Solar LP is actively consulting with the CRCA to develop the Sol-Luce Kingston Solar PV Energy Project in compliance with Ontario Regulation 148/06 and will secure the appropriate permitting where required.

Further, Kingston Solar LP recognizes that while features such as headwater streams and ephemeral streams are not recognized water bodies under Ontario Regulation 359/09 and therefore not considered within the context of this Water Addendum Report, these features, if applicable will be provided consideration during ongoing consultation with the CRCA.

4.4 Records Review Conclusions

The determinations made in Section 4 will form the baseline knowledge for the amended project location. Fieldwork completed to date, in addition to consultation with the CRCA and the MNR, will be used to determine the accuracy of this records review during the site

investigation. Table 3 summarizes the determinations made during this water body records review. All applicable potential water bodies within the amended project location and surrounding 300 m are outlined on Figure 3.

Table 3: Summary of the Water Body Records Review

Water Body ID	Source of Information*	Distance Relative to Project Location
Lakes		
No known features identified within the amended project location or adjacent lands within 300 metres; Two open water areas will be assessed for applicability to *Ontario Regulation 359/09*.		
Lake Trout Lakes		
No known features identified within the amended project location or adjacent lands within 300 metres		
Permanent and/or Intermittent Streams		
Unevaluated GC Trib-2b	MNR LIO Data	Within 120 m of Site 25b
Unevaluated GC Trib-2b-i	MNR LIO Data	Within 120 m of Site 25b
Seepage Areas		
No known features identified within the amended project location or adjacent lands within 120 metres		
Provincial Plan Areas		
Oak Ridges Moraine Conservation Plan Area	Provincial Plan Area Records	Not applicable
Niagara Escarpment Plan Area	Provincial Plan Area Records	Not applicable
Greenbelt - Natural Heritage System	Provincial Plan Area Records	Not applicable
Greenbelt – Protected Countryside	Provincial Plan Area Records	Not applicable
Lake Simcoe Protection Plan	Provincial Plan Area Records	Not applicable

5. Water Body Site Investigation

The purpose of the site investigation was to analyze the accuracy of the determinations made in the records review. It is consistent with Section 31 of *Ontario Regulation 359/09*, which states that a person who proposes to engage in a renewable energy project shall ensure that a physical investigation of the land and water within 120 metres of the project location is conducted for the purpose of determining:

- Whether the results of the analysis summarized in the [Records Review] report are correct or require correction, and identifying any required corrections;
- Whether any additional water bodies exist, other than those identified in the records review;
- 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,
- The distance from the project location to the boundaries of the water body.

For the purposes of this Water Addendum Report, the site investigation was focused on the areas of the amended project location.

5.1 Site Investigation Methodology

Based on the determinations made during the records review of the amended project location, water bodies that were mapped within 120 metres of the amended project location were the subject of a site investigation of the amended project location. The amended project location was visited by site investigators in order to document the applicable water bodies within the project location and determine if any additional water bodies were present. Documentation of applicable and accessible water bodies generally consists of a record of qualitative and quantitative observations including type of water body, average annual high water mark, habitat types, surrounding riparian composition and taking of representative photographs. Further efforts were co-ordinated with the team of site investigators conducting the natural heritage assessment of the amended project location to locate any potential water bodies not identified during the records review and to further characterize the surrounding lands.

5.1.1 Names and Qualifications of Site Investigators

The names and qualifications of the water body site investigator are outlined in Table 4 below. The site investigators became involved with the Sol-Luce Kingston Solar PV Energy Project at the time when the MOE technical review was put on hold and these addendum studies were initiated for the new Sites included in the amended project location. All those listed below

have been involved in numerous renewable energy projects that have been approved under *Ontario Regulation 359/09*.

Table 4: Names and Qualification of Site Investigators

Name	Degrees and Professional Designations	Years of Experience	Project Role	Certifications
Jennifer Petruniak	- B.Sc. (Biology) - M.Sc. (Biology)	9	- Water Assessment - Project Manager - Lead Biologist	- Ontario Benthos Biomonitoring Network Certification - Class 2 Electrofishing Crew Leader Certification Course - LEED AP
Jessica Wright	- B.Sc. (Env. Science) - M.E.S.	8	- Water Assessment	- Ontario Benthos Biomonitoring Network Certification - Class 2 Electrofishing Crew Leader Certification Course - Ontario Stream Assessment Protocol

5.1.2 Site Investigation Dates, Time, Duration and Weather Conditions

The details of the site investigation completed in accordance with REA Section 31(3) are provided in Table 5 and should be read concurrently with Table 4. Field notes are included in Appendix B.

Table 5: Site Investigation Date, Times, Duration and Weather Conditions

Date (2013)	Survey Type	Site Investigator(s)	Start Time	Duration (hours)	Weather Conditions (Field Observations)			Weather Conditions (EC* Station)		
					Air Temp. (°C)	Wind (Beaufort Scale)	Cloud Cover (%)	Mean Air Temp. (°C)	Wind (Speed/Direction)	Precipitation (mm)
October 8	Water Assessment	JP/ JW	08:30	6	10	1	0	9.4	n/a	0

*Closest Environment Canada (EC) Weather Station is in Kingston, Ontario. All EC Data refers to daily values; n/a indicates the information was not available from an Environment Canada weather station from the date/time of field work.

5.1.3 Access to Adjacent Lands

As outlined in *Ontario Regulation 359/09*, all lands within 120 metres of a project component are required to be assessed for water bodies. In the case of this project, direct access was not available to some lands located within 120 metres of the amended project location. Some of the lands surrounding the project location for Sites 2, 25a, and 25b were not accessed at the time of the site investigations. In these areas, an alternative site investigation was conducted. Water bodies located on adjacent lands where access was not available were assessed from property lines and road rights-of-way, where applicable (see Appendix C). This alternative site investigation was conducted in accordance with *Ontario Regulation 359/09*.

5.2 Site Investigation Results

Based on the site investigation, the occurrence or absence of water bodies within the amended project location or surrounding 120 metres is documented below. In addition to assessing if the results of the records review were correct or required corrections and/or amendments, information relating to each water body, if any, within the amended project location and surrounding 120 metres was collected. This included the type of water body, plant and animal composition and the ecosystem of the land and water investigation. In consideration of

potential Lake Trout lakes, a review of the land within 300 metres using the alternative site investigation methodology (where possible) was undertaken. Field notes are included in Appendix B and representative photographs of the features discussed in this section are presented in Appendix D.

5.2.1 Lakes

As outlined in Table 3, a search and analysis of the records and resources did not identify any lakes in the amended project location or within the surrounding 300 metres. The results of the site investigation confirmed this determination for lands within 300 metres of the project location.

Within the amended project location, two open water areas were mapped during the Records Review (see Figure 3). Neither feature had identifiable inflow or outflow channels; both were assessed to be dug farm ponds and therefore do not meet the definition of a water body (see Photos 1 and 2, Appendix D). Additional dug farm ponds were observed during the field investigation. As these are not applicable water bodies, they are not included in this assessment.

5.2.2 Lake Trout Lakes

As outlined in Table 3, a search and analysis of the records and resources did not identify any lakes that had potential to support a managed population of Lake Trout in the amended project location or within the surrounding 300 metres. The results of the site investigation confirmed this determination for lands within 300 metres of the project location.

5.2.3 Permanent and/or Intermittent Streams

As outlined in Table 3 and Figure 3, a search and analysis of the records and resources identified two unevaluated streams within 120 metres of the amended project location. These potential water bodies were the focus of the site investigation work. Field notes are available in Appendix B and Appendix D contains representative site photographs.

Within the project location, the lands were traversed to search for water bodies that may not have been identified during the records review and mapped on Figure 3. The boundary of the

amended project location was travelled to identify areas of flow coming off of or on to the lands. No features indicative of a permanent or intermittent stream were identified within the amended project location. Access to lands within 120 metres of the amended project location to the west where the two unevaluated streams were mapped (see Figure 3) was not granted at the time of the site investigation and an alternative site investigation was conducted. From the western boundary of the amended project location, no evidence of either potential water body was observed. This included the absence of a defined channel, observable water, or any of the other characteristics indicative of a permanent or intermittent stream.

In the general area where the unevaluated GC Trib-2b was mapped to the west of the amended project location boundary, a linear feature was observed to have the potential to convey flow (see Photo 3, Appendix D). A derelict culvert was also found embedded in the soil; no features characteristic of an associated channel were observed. In the absence of data to support the exclusion of this feature outside of the amended project location boundary, it will be treated as an intermittent stream. In addition, GC Trib-2b-i, the tributary that is mapped in association with GC Trib-2b, will also be treated as an intermittent stream in the absence of data to exclude this feature. These features are mapped on Figure 4. The lands immediately adjacent (i.e., within 30 m) of these "treated as" intermittent streams were identified as a cultural meadow (Figure 5; Photo 4, Appendix D).

5.2.4 Seepage Areas

As indicated in Table 1, a search and analysis of applicable records and resources of the amended project location did not identify any seepage areas, as defined by *Ontario Regulation 359/09*, in the amended project location or surrounding 120 metres. The results of the site investigation verified this determination.

Sol-luce Kingston Solar PV Energy Project

Figure 4 Water Body Site Investigation

QUABBIN ROAD

VAN ORDER ROAD

HIGHWAY 38

Site
25b & 25a

83 m

35 m

GC Trib 2b-i

GC Trib 2b

B

A

Site
2

ROCK ROAD

Glenvale Creek

UNITY ROAD

SMITH ROAD

WESTBROOK ROAD

Legend

- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Treated as Intermittent Stream
- Unevaluated Water Body
- Fence Line
- Project Location
- Amended Project Location
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback
- A Dug Farm Pond
- Unevaluated Wetland
- Woodland (MNR)

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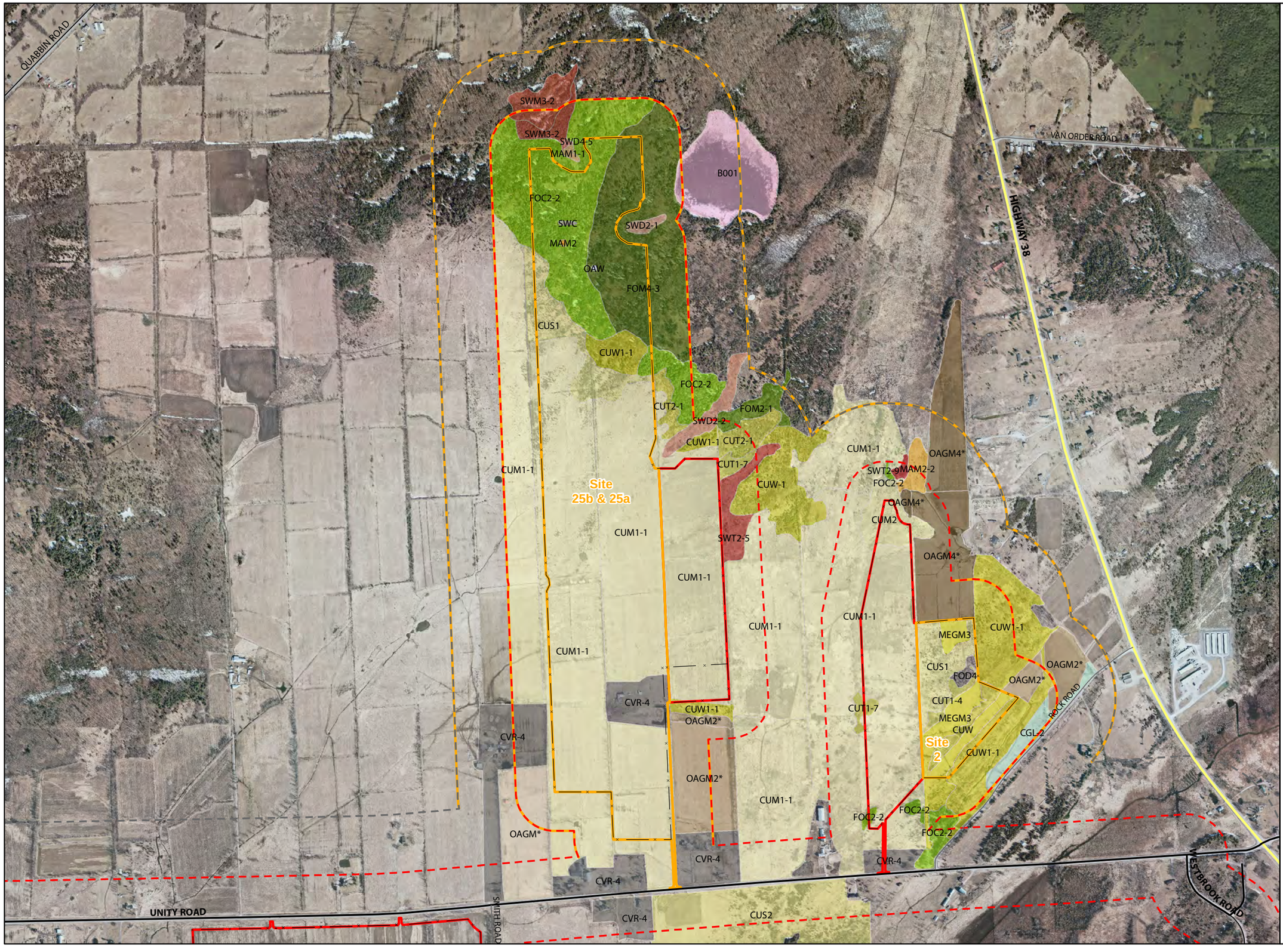
Sol-luce Kingston Solar PV Energy Project

Figure 5
Ecological Land Classification



Legend

- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Fence Line
- Project Location
- Amended Project Location
- 120 m Project Location Setback
- 300 m Project Location Setback
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback

Ecological Land Classification

- B001
- CGL-2
- CUM1-1
- CUM2
- CUS1
- CUS2
- CUT1-4
- CUT1-7
- CUT2-1
- CUW
- CUW-1
- CUW1-1
- CVR-4
- FOC2-2
- FOM2-1
- FOM4-3
- MAM1-1
- MAM2
- MAM2-2
- MEGM3
- OAGM*
- OAGM2*
- OAGM4*
- OAW
- SWC
- SWD2-1
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5.3 Summary of Amendments to the Records Review

Based on the results of the site investigations, no previously unidentified water bodies were identified within the amended project location or surrounding 120 m. Results of the site investigation of the unevaluated streams mapped within the project location determined that, in the absence of sufficient data to exclude the features, the mapped streams will be "treated as" intermittent streams and are therefore applicable water bodies. The two open water areas were determined to not meet the definition of a water body.

5.4 Site Investigation Conclusions

Based on the results of the site investigations, no water bodies occur within the amended project location. Due to a lack of direct access, the two mapped streams that discharge into Glenvale Creek will be treated as intermittent streams and are mapped as they were provided by the source data (see Appendix A). Neither occurs within 30 metres of the project location (see Figure 4). Based on this, an Environmental Impact Study (EIS), as outlined under REA Sections 39 and 40, is required for this project.

Table 6 summarizes the results of the site investigation in the context of the proposed project.

Table 6: Summary of the Water Assessment Site Investigation

Water Body ID	Does the project location overlap a water body?	Is the project location within 120 m of the water body?	Distance to nearest project components	Project Components within 120 m of the water body	EIS Required?
Lakes					
None identified within the amended project location or adjacent lands within 120 metres					
Lake Trout Lakes					
None identified within the amended project location or adjacent lands within 300 metres					
Permanent and/or Intermittent Streams					
GC Trib-2b *Tributary to Glenvale Creek*	No	Yes	35 m to the perimeter fence	▪ Fence ▪ Access Road ▪ Solar Panels ▪ Racks	Yes
GC Trib-2b-i *Tributary to Glenvale Creek*	No	Yes	83 m to the perimeter fence	▪ Fence ▪ Access Road ▪ Solar Panels ▪ Racks	Yes
Seepage Areas					
None identified within the amended project location or adjacent lands within 300 metres					

6. Water Body Environmental Impact Study

This Water Environmental Impact Study (EIS) section was completed so that Subsection (1) of Section 40 of *Ontario Regulation 359/09*, which prohibits construction and development of a renewable facility within 120 meters of the average annual high water mark of a water body, does not apply. By completing the applicable components of the EIS in accordance with guidelines established by the MOE, select project components may be constructed and installed within 120 meters of a water body. This report is consistent with Section 40 of *Ontario Regulation 359/09*, which details that the 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 metres 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 EIS section will be to fulfill the requirements of Section 40 for the features identified in Table 6 that were carried forward as meeting the definition of "water body" under *Ontario Regulation 359/09* and are within 120 meters of the project location.

6.1 Rationale for Development Within a Water Body Setback

The location of the Sol-Luce Kingston Solar PV Energy Project has been subject to numerous field investigations and consultation activity with various stakeholders. A thorough review of constraints to development was undertaken prior to delineating the final project location. Based on the natural environment information collected (i.e., natural features and water bodies), as well as setbacks sought by stakeholders, the project location was revised to avoid impacts to significant and/or sensitive features and to provide the appropriate setback(s) from property lines and residences. The layout of the solar facility has been designed to avoid locating all solar panels and the transformer substation within 30 metres of the average annual high water mark of a permanent or intermittent stream or any other water body. Where possible, all project components have been located beyond the 30 m setback of streams that occur in association with the project location.

6.2 Description of Project Activities

The purpose of this *Water Addendum Report* was to include the amended project location into the overall *Water Assessment and Water Body Report* for the project. Details pertaining to the project construction, design and operations and decommissioning, as described in the original REA submission (see the project *Construction Plan Report, Design and Operations Report and Decommissioning Plan Report* as submitted to the MOE on September 18, 2012 and the *REA Modification Document* for the project), remain unchanged. For clarity and reference, we have included standard activities that occur during the construction, operations and decommissioning phases in Table 7 below. Please note, these descriptions are meant to be

representative in nature and where discrepancies occur between the information presented in Table 7 below and the project *Construction Plan Report*, *Design and Operations Report*, *Decommissioning Plan Report* and *REA Modifications Document*, the information presented in these project reports shall supersede that in Table 7. A schedule for the activities below has not been provided as it is dependent on receipt of applicable permits and approvals.

Table 7: Representative Construction, Operations and Decommissioning Activities

Activity	Description
CONSTRUCTION PHASE	
Survey and staking of project location	At the beginning of 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, compacting and grading	The project location will be minimally graded to facilitate construction activities as per a grading plan and will maintain the general drainage patterns of the site as much as possible. Graders, bulldozers, scrapers, soil compactors, dump trucks, wheel loaders and backhoes may be used to prepare the site. Selective clearing of trees and vegetation will be required for installation. Major excavation works or fill placement are not expected for the project. The primary excavation work is likely to be limited to soil removal for building foundations, access roads and digging trenches to run underground electrical cables. Topsoil removed from the permanent access road will be distributed across the project location. Any excess topsoil may be used to infill low-lying areas if appropriate. Temporarily stockpiled topsoil will be stored to minimize erosion from wind and precipitation.
Drainage and erosion control	Temporary and/or permanent equipment to manage flow and protect natural features during construction/operation will be installed. Temporary erosion and sediment control measures will be installed to protect natural features, water bodies and other considerations identified in the Natural Heritage Assessment and Water Body Reports. Common construction stormwater management practices typically include the use of

Activity	Description
	hay bales and silt fence barriers. The temporary control measures will remain installed throughout the construction period and will be routinely inspected by the contractor.
Installation of perimeter fence and security lighting	Fencing will be installed for the duration of the project lifespan along the perimeter of the project location. The fence will be constructed as required by the Electrical Safety Act. Gated entrances will be installed where required. For security and maintenance purposes, lights may be installed near the entrance(s) of the facility and task-specific lights will be provided as necessary. These will be appropriately shielded or directed to avoid impacts to neighbours.
Construction of access roads and installation of temporary power	Culverts across any road drainage will be installed if necessary and as required through the entrance permit. The main access road will be constructed as appropriate for the project site and engineering design. Internal on-site granular access roads will be developed. The location of the internal access roads and their nature may change. Row to row rack spacing will be large enough such that service vehicles can access modules and wiring for maintenance. The central on-site road will allow a service vehicle to access each inverter station directly. Internal access roads will be approximately 4 m to 7 m wide. Water will be trucked in and sprayed as necessary for dust control during construction. The use of gravel will reduce water use for dust control during construction. During the construction period, the only on-site electricity to be used is a combination of temporary local service and/or on-site generators. Electricity required for temporary construction offices, lighting and other purposes will be arranged for and obtained from the local electricity provider.
Delineation of temporary storage and construction areas and installation of temporary facilities	Temporary laydown and construction staging areas will be created within the boundary of the project location. 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-

Activity	Description
	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 portion of the area may be retained to accommodate vehicle parking for maintenance personnel and equipment storage.
Construction of foundations	The substation area will be prepared and excavated for the transformer foundations and the oil containment area. The type of foundation (concrete, steel piles) will depend on the results of geotechnical studies and the supplier selected, thus the construction methods vary. Inverter stations may also require excavation for foundations. Foundations for the substation and inverter stations may consist of the installation of ground screws or plate-pounded steel beams with possible pre-drilling. If concrete foundations are used, concrete may be prepared off-site and a transit mixer truck from a local supplier will deliver ready-mix concrete to the sites and pour it into forms. A communications tower, estimated at approximately 25 m in height will be constructed as stipulated by Hydro One for their remote emergency disconnect.
Installation of support, racking and PV modules	The panels will be aligned in rows approximately 4-10 metres apart and will be mounted on fixed aluminum or steel racking systems which will be attached to galvanized steel support structures. The type of foundations will be determined based on geotechnical studies and final vendor selection.
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 inverter stations which will convert the DC electricity into AC electricity suitable for distribution to the local grid. Each inverter station contains one or two inverters. The number of inverters used may vary based on electrical engineering and interconnection requirements.

Activity	Description
	Step-up transformers located in the inverter stations will increase the voltage of the electricity collected to a mid-voltage distribution level which will then be carried below ground to a main step-up transformer. A pad mount transformer will then increase the voltage further for connection to the Hydro One transmission grid. The exact location of the transformers may vary from the initial site plan but will be within the project boundary and meet all noise requirements. After all major construction activities are complete the components will be tested. If any problems or issues arise, remedial corrections and calibration of equipment will be made prior to start-up.
Remediation and clean-up of work areas	All construction-related waste from the project site will be removed/reused/recycled where applicable once the project is complete. Trucks will be used to remove all non-permanent equipment from the project location, along with any debris.
Site landscaping and vegetation	Once construction and site clean up is complete the project location will be seeded with native vegetation as required or allowed to seed naturally. Planting of visual mitigation measures will be undertaken at strategic locations.
OPERATIONS PHASE	
Monitoring and meter calibrations	The facility will be managed twenty-four hours a day on-site or offsite through remote monitoring 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 facility to correct any problems.
Routine periodic maintenance and inspection of project components	Site visits by the operations manager will occur as scheduled to inspect the solar farm and project location and ensure that the facility is in proper working order. Activities that may 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 occur as required.

Activity	Description
	Transformers will be inspected as part of this inspection.
Lighting	For security and maintenance purposes, shielded, task-specific lighting may be installed. All exterior lights will be directed or shielded to minimize their impact.
Cleaning of panels	Cleaning of panels and equipment will take place as required. All water required for panel washing may be trucked to the project location. No harmful cleaning solutions of any type will be used to wash the panels.
Major maintenance	Should major maintenance be required it will be performed within the project boundary.
Periodic landscape maintenance	Once construction activities are complete, exposed soils will be seeded with a native grassland seed mix or allowed to seed naturally. 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. This will be done in consideration of any seasonal limitations outlined in the Natural Heritage Assessment. There is no intention to use herbicides for managing the vegetation.
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.
Drainage and erosion control	Stormwater runoff at the project location will be managed as per a stormwater management and drainage plan to be developed and sealed by the Civil Contractor; this will be done with consideration to maintaining pre-construction drainage patterns and any recommendations or limitations outlined in the Natural Heritage Assessment or Water Assessment.
Waste	The operation of the system does not produce waste of any kind. All debris as a result of maintenance or cleaning will be removed from the site immediately by the contractor.

Activity	Description
DECOMMISSIONING PHASE	
Removal of PV modules and associated equipment	• Disconnect all aboveground wirings, cables and electrical interconnections. • Remove PV modules from racks and ship to recycling facilities or manufacturers for material reuse. • Dismantle and remove all racks and support structures, including extraction of in-ground support structures (see below).
Removal of inverter stations and transformers	• Remove inverters and associated components including combiners, low voltage switch gear and medium voltage transformers. • Remove meters, fans, lighting fixture(s) and other electrical components. • If concrete foundations have been used for inverter stations or substation they will be removed (see below).
Removal of access roads and other components	• If access road removal is deemed necessary, aggregates will be stripped along with underlying geotextile fabric and trucked to landfill. • All compacted areas will be tilled in a manner adequate to restore the sub-grade material. Clean, compatible sub-grade material, followed by topsoil will be applied as necessary. • Fences and gates will be removed and recycled. • Above ground lines and poles that are owned by Kingston Solar LP will be removed and holes will be filled with clean fill. • The communication tower will be dismantled and components will be removed. • Any culverts installed will be removed or remain in place at the request of the landowner and the road bedding material will be replaced with clean sub- and top-soil.
Removal of underground cables	• Underground electrical lines will be cut and the ends buried to 1m below grade and left in place. These lines are inert and will have no negative impacts on the environment, soil and/or cultivation practices.

Activity	Description
Removal of equipment foundations	• The substation, inverter stations and steel racking for the solar modules will have foundations that require removal. These foundations will likely consist of steel piles but may also include concrete. Other underground infrastructure requiring removal may include concrete protective electrical structures. It is anticipated that structures will be fully removed from the ground and that the affected area shall be backfilled as necessary. Waste concrete will be recycled offsite by a concrete recycler or crushed onsite and used as backfill material.

6.3 Environmental Effects of the Project

The potential negative environmental effects, mitigation and residual effects to the applicable water bodies within 120 metres (see Section 5.2.3) of the amended project by project activities relating to site preparation, construction, maintenance, operations and decommissioning are outlined in Table 8. In many cases, the project activities may overlap (e.g. clearing and equipment laydown). Where activities overlap, the first activity in the project activity sequence or that which has the broadest potential impact is evaluated in Table 8.

The perimeter security fence, representing the outer boundary of the amended project location, is located at least 30 metres from both GC Trib-2b and GC Trib-2b-i. No solar panels or transformer substation will be located within 30 metres of a water body (see Figures 2 and 4). None of the activities outlined in Table 7 are expected to have any physical or functional effect on a water body provided the appropriate mitigation measures are implemented and maintained.

Table 8: Potential Environmental Effects on Water Bodies within 120 metres of the Amended Project Location

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	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	No water bodies within 30 metres.	▪ Changes in natural drainage, including increased or decreased surface runoff; increased or decreased stream flows and redirection of surface flow ▪ Potential for soil mobilization and erosion resulting in increased sedimentation and turbidity ▪ Increased inputs of nutrients and/or contaminants ▪ Increased sedimentation and turbidity may affect fish habitat (e.g., spawning areas, food sources, benthic composition)	LOW	Single event; Temporary during site preparation phase	Throughout construction phase until vegetation is established and/or soil stabilized in the project location	▪ An erosion and sediment control plan will be developed for the site and installed prior to project activities ▪ Existing vegetation buffers between the project location and the streams will remain unchanged ▪ Construction activities will occur in the area surveyed to be part of the project location only ▪ Silt fencing will be installed in areas where there is potential for run-off to the receiving water bodies (i.e., perimeter of project location) ▪ Appropriate erosion control measures will be used as needed to prevent erosion and soil mobilization ▪ Areas disturbed during construction of the facility will be re-vegetated using native grassland species or will be allowed to re-vegetate naturally ▪ 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.
Construction of Access Roads	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	No water bodies within 30 metres.	▪ Limited potential to decrease surface permeability and redirect surface runoff ▪ Decreased site permeability has potential to increase amount of surface runoff ▪ Increased sedimentation and turbidity may impact fish habitat (e.g., spawning areas, food sources, benthic composition)	LOW	Throughout lifespan of project (20 years)	Roads will be in place throughout the lifespan of the facility (20 years)	▪ Access roads have been designed to promote infiltration ; the roadways within the project location will be gravel ▪ Existing vegetation buffers will be maintained ▪ The quantity and quality of stormwater runoff from construction will be controlled using best management practices	NONE.

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
Installation of services and utilities requiring groundwater taking (ex., installation of solar panel poles and underground cables)	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	No water bodies within 30 metres.	▪ Overland disposal of water required by dewatering activities ▪ Limited potential for disruption of nearby stream ▪ Increased erosion, sedimentation and potential for flooding of nearby water bodies or intolerant vegetation ▪ Potential for loss of aquatic habitat and/or species	LOW	Single event; Temporary	During installation of project components	▪ Pump water encountered during installation of project components to vegetated areas for natural infiltration and avoidance of soil mobilization or use of a temporary storage basin in a disturbed area of the project location more than 30 m from a water body. ▪ Control rate and timing of water pumping. Where dewatering is required, amount will not exceed 50,000 L/day.	NONE.
Storage and Use of Construction Materials and Equipment	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	No water bodies within 30 metres.	▪ Limited potential for accidental spills or contamination of soil and/or surface runoff from equipment and machinery ▪ Runoff of contaminated soil and/or surface runoff may impact fish habitat and water quality of downstream receiving waters	LOW	Short-term; only when construction materials and equipment on site	During construction phase	▪ Construction equipment and materials will be primarily stored in the construction laydown area. No equipment or materials will be stored within 30 m of a water body. ▪ Efforts will be made to avoid tracking soil from the project location onto municipal roads.	NONE.
Operations Phase								
Facility Operation	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	No water bodies within 30 metres.	▪ Some potential for an overall decrease in permeability of project location (solar panels are impervious) ▪ A decrease in site permeability may lead to an increase in surface runoff. ▪ Limited potential for increased erosion, sedimentation and turbidity to receiving waters	NONE	Throughout lifespan of project (20 years)	Throughout lifespan of project (20 years)	▪ 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.	NONE.

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
Accidental spills from transformers (inverters and substation)	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	No water bodies within 30 metres.	▪ Limited potential for accidental spills or contamination of soil and/or surface runoff ▪ Runoff of contaminated soil and/or surface runoff may impact fish habitat and water quality of downstream receiving waters	LOW	Throughout lifespan of project (20 years)	Throughout lifespan of project (20 years)	▪ Transformers to be located more than 30 m from a water body. ▪ Spill containment structures associated with the transformer substation. ▪ A spill kit will be kept on-site. ▪ The Emergency Response and Communication Plan will be followed should a spill occur (as outlined in the Design and Operations Report). ▪ Notification of MOE (Spills Action Centre) in the event of a spill.	NONE.
Decommissioning Phase								
Removal of above-ground project components	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	No water bodies within 30 metres.	▪ Some potential for groundwater resources and/or connected water bodies in the general area to be impacted by removal of project components that may intersect the groundwater table (i.e., impacts on the base flow levels) ▪ Potential for loss of aquatic habitat and/or species	LOW	During decommissioning phase	During decommissioning phase	▪ An erosion and sediment control plan will be developed for the site and installed prior to decommissioning activities. ▪ If possible, restrict removal of project components that intersect with groundwater to periods of low flow.	NONE.
Removal of access roads	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	No water bodies within 30 metres.	▪ Some potential for changes in surface runoff ▪ Increased sedimentation and turbidity may impact fish habitat (e.g., spawning areas, food sources, benthic composition)	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. ▪ 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.

6.4 Environmental Effects Monitoring Plan

The environmental effects monitoring plan (EEMP) prepared for Sol-Luce Kingston Solar PV Energy Project is targeted towards environmental effects that have potential to occur during the construction, design and operation, and decommissioning of the facility. The potential negative environmental effects outlined in Table 9 below are specific to the water bodies identified within 120 metres of the project location and will form part of the overall EEMP for the project in the *Design and Operations Report* and the *Construction Plan Report*, as applicable. This EEMP may also be overviewed in the *REA Modifications Document*, as applicable. Table 9 summarizes the monitoring plan and monitoring frequency during operation of the facility, as well as contingency measures that will be undertaken if performance objectives are not achieved.

Table 9: Water Body Environmental Effects Monitoring Plan for the Construction, Operation and Decommissioning of the Sol-Luce Kingston Solar PV Energy Project

Potential Environmental Effect	Affected Water Body	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 increase surface runoff and soil mobilization may impact receiving water bodies.	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	▪ An erosion and sediment control plan will be developed for the site. This plan will include standard erosion and sediment control measures such as silt fencing, erosion control blankets and/or hay bales, etc.	NONE.	▪ Appropriate ESC measures are implemented prior to and during construction. ▪ ESC controls are maintained during the construction phase.	Routine checks of ESC controls implemented.	At areas where ESC controls are constructed.	Check to occur regularly 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 MNR/MOE/CRCA if requested.	All breaches to ESC controls will be repaired within 24 hours of notification. If during the routine checks it is determined that ESC controls are not sufficient, all work may be required stop until appropriate ESC controls can be established.
Dewatering during installation of underground project components may affect local hydrological regime (groundwater). Overland dispersal of water during dewatering may increase surface runoff.	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	▪ Control the rate and timing of water pumping. Pump water onto vegetated surfaces if possible or into a temporary retention basin. If possible, restrict groundwater taking to low flow time periods. ▪ Implement ESC measures and monitor/report as indicated above. ▪ Water takings to be <50,000 L/day.	NONE.	▪ Any dewatering activities required during installation of project components will be controlled to ensure pumped water re-infiltrates the ground without causing increased run-off.	Ensure dewatering occurs into vegetated areas or into a temporary retention basin.	Where installation requires dewatering.	Once during construction/ during installation of project components.	Site records to include record of locations that required dewatering and the volume of water taken each day.	If dewatering causes increased soil mobilization or surface run-off in areas of exposed soil, dewatering activities will be stopped until a solution can be implemented. If water taking needs to exceed 50,000 L/day, the MOE will be consulted.
Storage and use of construction materials and equipment may introduce soil run-off or other substances into receiving water bodies.	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	▪ Construction equipment and materials will be primarily stored in the construction laydown area. No equipment or materials will be stored within 30 m of a water body. ▪ Efforts will be made to avoid tracking soil from the project location onto municipal roads.	NONE.	▪ Store equipment and materials more than 30 m from a water body	Routine checks of equipment and machinery storage Reduce/eliminate potential for soil to be tracked onto municipal roads by equipment	Municipal Roads and the construction laydown area.	During the construction phase.	Site records to include details of equipment and material storage and use of municipal roads.	If soil is mobilized onto municipal roads by equipment, road sweeping efforts may be required.
Operations Phase									
Provide for the permanent establishment of vegetation in project	(Potential) Intermittent GC Trib-2b and GC Trib-	▪ Upon completion of project construction, the project location will be vegetated with a mix of native grasses	NONE.	▪ Ensure the site is re-vegetated within one growing season ▪ ESC controls to remain	Visual check of the project location to ensure re-vegetation of lands	Throughout the project location	Weekly until evidence of growth is observed,	Photo documentation will be collected showing soil stabilization and maintenance of pervious	▪ If the performance measures aren't met, areas with no growth will be vegetated using a

Potential Environmental Effect	Affected Water Body	Mitigation Strategy	Residual Effects	Performance Objective(s)	Monitoring Plan				Contingency Measures
					Methodology	Monitoring Locations	Frequency/ Duration	Reporting Requirements	
location to minimize exposed soils that may impact receiving waters downstream.	2b-i *Tributaries to Glenvale Creek*	and/or monitored to ensure land naturally re-vegetates within one growing season.		in place until soils are stabilized by vegetative growth.	occurs		then monthly until all areas are vegetated/re-vegetated.	conditions through vegetation establishment. ESC logs will be maintained until vegetative cover is established.	native seed mix. ▪ ESC measures will be implemented and maintained until vegetation is shown to be established and thriving.
Accidental spills from transformers (inverters and substation).	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	▪ Spill containment structures associated with the transformer substation.	NONE	▪ Avoidance of deleterious materials entering into a water body.	Routine checks of transformers to ensure appropriate working order.	Transformer locations (substation).	Throughout project lifespan.	Site maintenance records to be kept for substation transformer.	▪ The Emergency Response and Communication Plan will be followed should a spill occur. ▪ Notification of MOE (Spills Action Centre) in the event of a spill. ▪ In the event of a spill from a transformer, the area of the spill will be remediated.
Decommissioning Phase									
Stabilization of exposed soils once project components are removed (if land is not returned to being actively farmed and/or as per landowner's instructions).	(Potential) Intermittent GC Trib-2b and GC Trib-2b-i *Tributaries to Glenvale Creek*	An erosion and sediment control plan will be developed for the site. This plan will include standard erosion and sediment control measures such as silt fencing, erosion control blankets and/or hay bales, etc.	NONE. Decommissioned project components will be removed and the project location restored to its original or better condition.	▪ Maintain appropriate and effect ESC measures during decommissioning activities.	Routine checks of ESC controls implemented during decommissioning phase Routine monitoring to ensure exposed soils are permanently stabilized (unless land is transitioned to agricultural operations).	Areas where ESC controls are implemented.	Check to occur regularly 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 controls are not sufficient, all work will stop until appropriate ESC controls can be established. ▪ If exposed soil shows signs of mobilization, appropriate corrective action is to be undertaken to prevent entry of soil into a water body.

6.5 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*. This amendment will be made through inclusion in the *REA Modifications Document.* The potential negative environmental effects to water bodies within 120 metres of the amended project location, as outlined in Table 9, will be negligible after mitigation measures are implemented. Upon the completion of construction, the exposed soil in the project location will be vegetated with a mix of native grasses and/or monitored to ensure natural re-vegetation occurs within one growing season.

Table 9 also summarizes the monitoring plan and monitoring frequency during the design and operation of the 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.

6.6 Negative Environmental Effects, Construction

As required in *Ontario Regulation 359/09*, the *Construction Plan Report* will include the information in Table 8 and Table 9 of this *Water Addendum Report* to address negative environmental effects anticipated on water bodies within 300 metres of the amended project location during the construction phase of the project. The determination that water bodies within 300 metres of the amended project location would not be impacted is due to the lack of impacts to water bodies at a closer distance of 120 metres. Consideration of water bodies within 300 metres is in response to MOE guidance on the requirements to be included in the *Construction Plan Report.* The potential negative environmental effects to water bodies within 120 metres of the project location, as outlined in Table 9, will be negligible after mitigation measures are implemented. During construction, appropriate erosion and sediment control measures will be implemented and maintained. If groundwater or an accumulation of surface water is encountered during the installation of project components in the project location, dewatering may be required but is not expected to exceed 50,000 L/day. Any such dewatering activity below this threshold is not expected to have an effect on the hydrological regime of the nearby applicable water bodies and is not subject to a Permit to Take Water.

Table 9 also summarizes the monitoring plan and monitoring frequency during the construction of the facility. Contingency measures that will be undertaken if performance objectives are not achieved are also included.

7. Additional Approval and Permitting Requirements Related to Water Bodies

Required permits and approvals from the Cataraqui Region Conservation Authority under *Ontario Regulation 148/06*, *Development Interference with Wetlands and Alterations to Shorelines and Watercourses* (developed under Section 28 of the *Conservation Authorities Act*) will be acquired prior to construction.

8. Conclusions

Through a records review and site investigation, it was determined that water bodies may exist within the prescribed setback areas (Figure 3) of the amended project location. As such, a Water EIS was required under Section 39 and 40 of *Ontario Regulation 359/09*. This EIS was completed to mitigate any potential negative environmental effects to the following water bodies:

- Intermittent Stream GC Trib-2b; and,
- Intermittent Stream GC Trib-2b-i.

Table 9 outlines how the activities related to the construction, operation and decommissioning of the facility may affect these water bodies and the appropriate mitigation and monitoring work to be implemented.

Together with the Water Assessment and Water Body Report (AMEC 2012) submitted to the MOE for review on September 18, 2012, this Water Addendum Report serves to fulfil the requirements of the project as they related to water bodies under Ontario Regulation 359/09. An overview of the applicable amendments to the original Water Assessment and Water Body Report (AMEC 2012) is provided under separate cover (Water Modifications Document).

9. References

Cataraqui Region Conservation Authority (CRCA). 2006. Central Cataraqui Region Natural Heritage Study Final Report.

City of Kingston. 2010. Official Plan. 348 pp.

Fisheries and Oceans Canada Aquatic Species at Risk Mapping for the Cataraqui Region Conservation Authority. May 2013. 8 pp.

Loyalist Township. 2010. Official Plan. 163 pp.

Natural Resources Canada. Centre for Topographic Information. http://atlas.nrcan.gc.ca/site/english/maps/topo/map. Accessed November 2013

Ontario Ministry of the Environment. 2013. Technical Guide to Renewable Energy Approvals. 267 pp.

Ontario Ministry of Natural Resources. Crown Land Use Policy Atlas. http://crownlanduseatlas.mnr.gov.on.ca/clupa.html. Accessed October 2013

Ontario Ministry of Natural Resources. Land Information Ontario. http://www.mnr.gov.on.ca/en/Business/LIO/index.html. Accessed October 2013.

Phair, C., Henson, B.L., and Brodribb, K.E. 2005. Great Lakes Conservation Blueprint for Aquatic Biodiversity. Volume 2: Tertiary Watershed Summaries. 454pp.

Appendix A
Data Layer Information

Table A1: GIS Data Layer Information

Title of Data Set	Data Layers	Vintage of Data or Date Info/Searched/Collected	Ownership of Information	Project Site
Wetland.shp	Wetlands	2011	MNR	KSPSP
PIN_Selection.shp	Parcel Boundaries	2012	First Base Solutions	KSPSP
Woodland.shp	Woodlands	2010	MNR	KSPSP
Watercourse.shp	Watercourse Features	2010	MNR	KSPSP
5mContour	5 m Contour Intervals	2010	MNR	KSPSP
Lots_Concesssions.shp	Lot and Concessions	2010	MNR	KSPSP
Railway.shp	Railway centrelines	2010	MNR	KSPSP
MajorCities.shp	Major Cities within Ontario	2008	ESRI	KSPSP
Province-Cut-out.shp	Province of Ontario Shapefile	2008	ESRI	KSPSP
Roads.shp	Hwy/Local/Secondary/Primary Roads	2010	MNR	KSPSP
Utility_Line.shp	Utility Lines	2010	MNR	KSPSP
Water_Body	Ontario Water Bodies	2010	MNR	KSPSP
Airport.shp	Ontario Airports and Airfields	2010	MNR	KSPSP

Appendix B
Field Notes

GENERAL FORM FOR ADDITIONAL NOTES

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GENERAL INFORMATION				
PROJECT #: 13-8532	NAME OF PROJECT: Sol-luce Kingston Solar	DAY: 8	MONTH: 10	YEAR: 2013
COLLECTORS: JLP, JW		TIME STARTED: 8:00		TIME FINISHED: 14:00
WEATHER: Cool AM, warming in PM (10°C); Beaufort 1; no precip.; no clouds.				

GENERAL NOTES

Property 2 → no applicable water bodies mapped during records review; none observed on-site. Landowner has ditched the property to control water surface flow for landscaping purposes/irrigation

Properties 25A/25B → potential water bodies investigated. Property boundaries traversed; no additional features

There are no features in amended project location that meet definition of water body

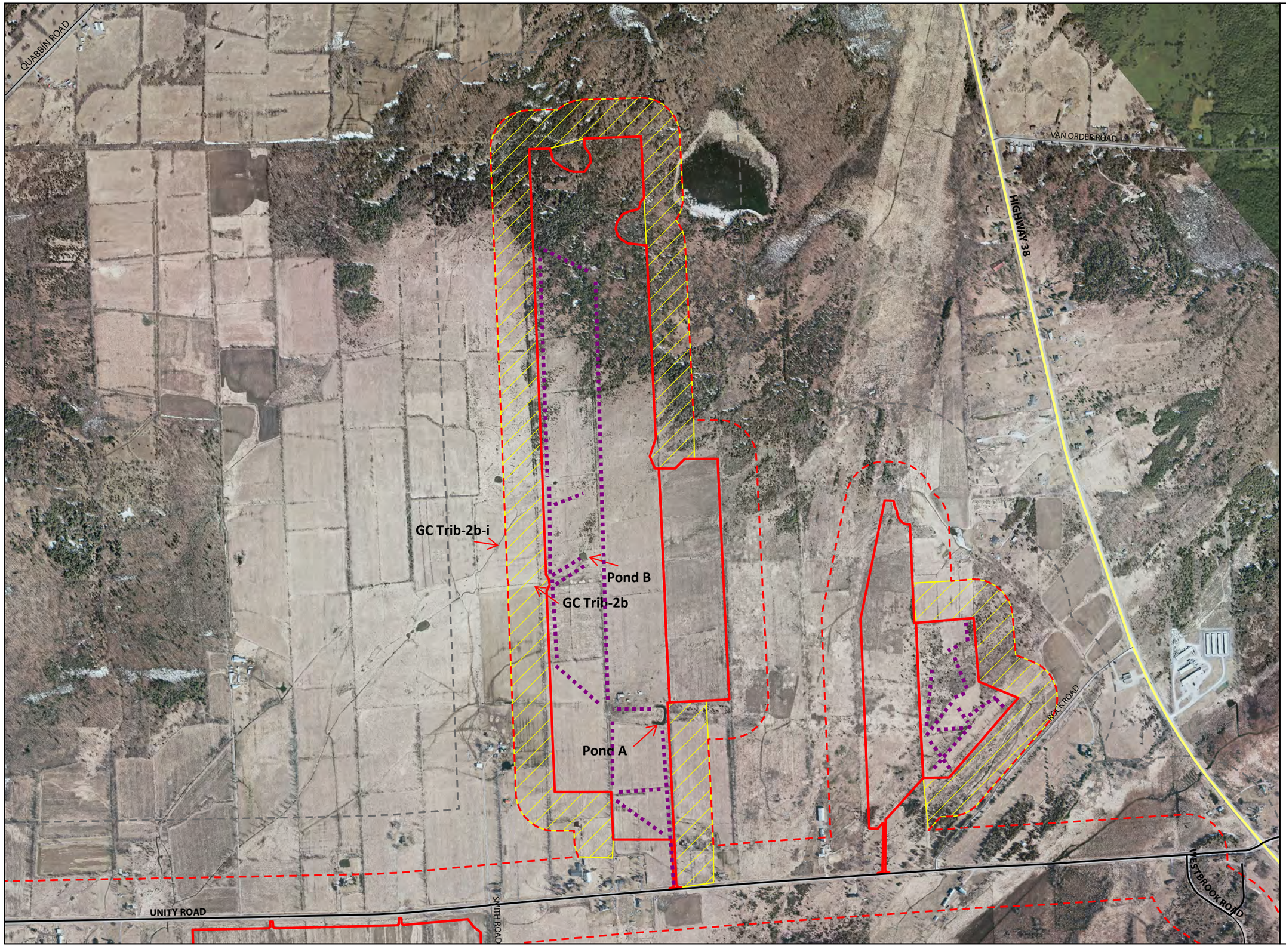
PHOTOGRAPHY LOG AND NOTES

PHOTO #	DESCRIPTION OF PHOTO
• POND A : Site 25A	
	- observations consistent with original AMEC 2012 water report
2818-2827	- Water feature mapped by background resources was a "C" shaped dug farm pond. No discernible inflow/outflow. Substrate recently scraped to pavement stone (dredged)
• GC Trib-2b	
2843	- views WNW from western property boundary of Site 25B.
2849	- Property line was walked in its entirety. No channels were observed
	- small discernible change in vegetation in cultural meadow within the western 120 m setback may be indicative of a channel. Direct access was not available at time of site investigation. Further downstream AMEC mapped as grassed swale (i.e., not applicable water body)
	- in absence of direct data regarding the mapped channel, suggest treating as intermittent stream
	- GC Trib-2b-i was not observable from property line. - in absence of data, treat as intermittent
• POND B : Site 25b	
	- open water area with evidence of livestock use. No discernible inflow/outflow. Dug farm pond.

Note: additional dug farm ponds observed but will not be included as they do not meet definition of water body

Sol-luce Kingston Solar PV Energy Project

Appendix C
Alternative Site Investigation



Legend

- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Potential Watercourse
- Fence Line
- Addendum Alternate Site Investigation Area
- Project Location
- 120 m Project Location Setback
- 300 m Project Location Setback
- **Site Investigation Route**

N
W E
S

1:11,000

0 100 200 300 m

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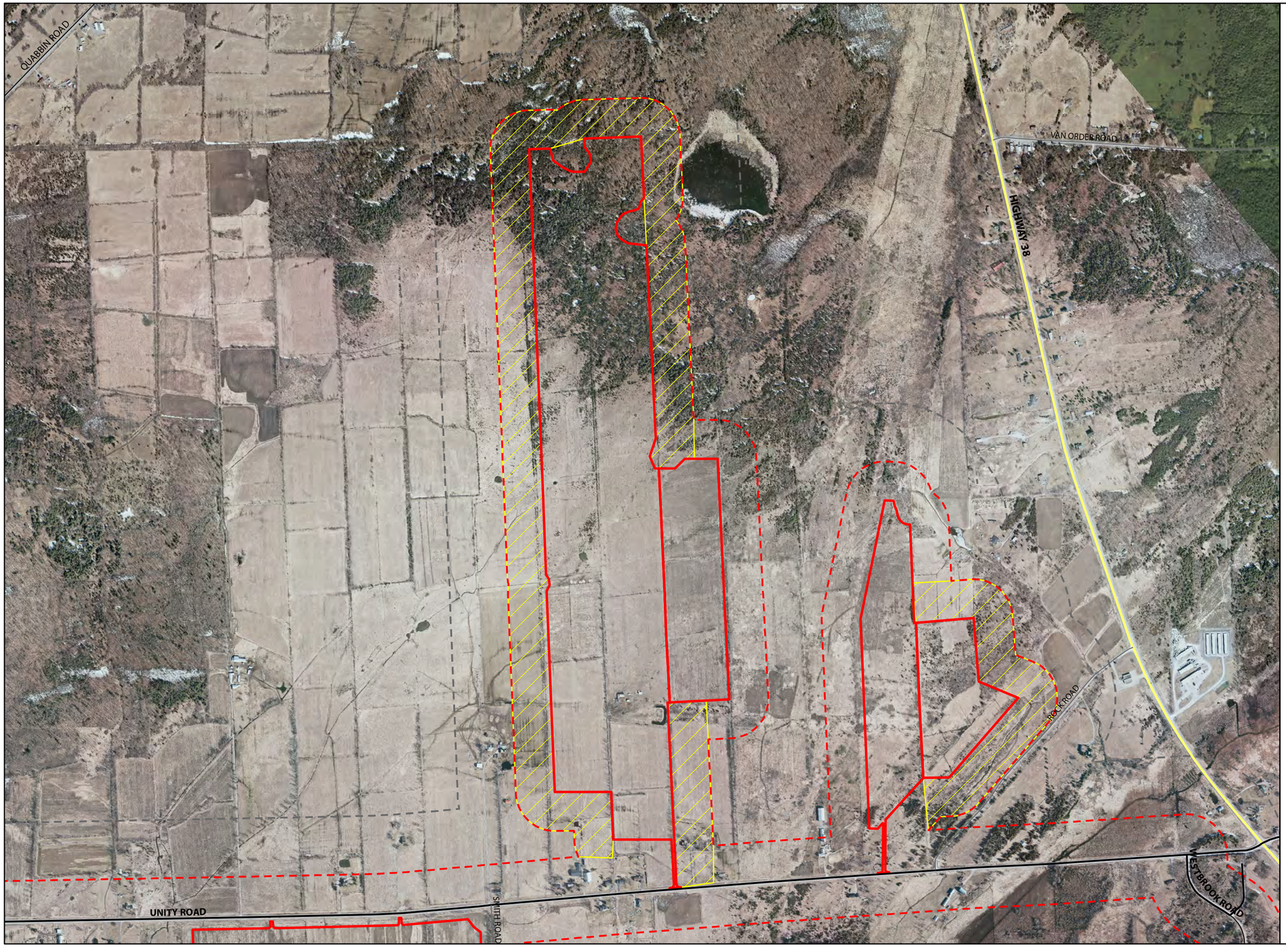
Created By: GM
Checked By: JLP
Date Created: 9/17/2013
Date Modified: 11/25/2013
File Path:I:\GIS\138504 Kingston Solar REA Amendment\Mapping\Water Body Assessment\Appendix C.mxd

Appendix C

Supplementary Mapping

Sol-luce Kingston Solar PV Energy Project

Appendix C
Alternative Site Investigation



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0 100 200 300 m

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Created By: GM
Checked By: JLP
Date Created: 9/17/2013
Date Modified: 11/25/2013
File Path:I:\GIS\138504 Kingston Solar REA Amendment\Mapping\Water Body Assessment\Appendix C.mxd

Appendix D

Site Photographs

Photo 1 October 8, 2013 Pond A on Site 25 A View west Dug farm pond down to pavement stone Area has been actively disturbed and has no evident inflow/outflow.	
Photo 2 October 8, 2013 Pond B on Site 25 B View North Dug farm pond No evident inflow/outflow.	

Photo 3 October 8, 2013 View West (zoomed in) View from western property line of Site 25B towards area where GC Trib-2b is mapped	
Photo 4 October 8, 2013 View West View of cultural meadow in the field(s) where GC Trib-2b and GC Trib-2b-i are mapped.