



SAMSUNG SOL-LUCE KINGSTON SOLAR PV ENERGY PROJECT

PROJECT DESCRIPTION REPORT DRAFT

Submitted to:
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1.0 PROJECT SUMMARY

1.1 Overview

Samsung Renewable Energy Inc. (hereinafter referred to as "Samsung") intends to design and construct a 100 MWac (megawatts of alternating current) solar power development in Eastern Ontario located in the City of Kingston and Loyalist Township (Figures 1 and 2). If approved, this facility will convert solar energy into electricity to be fed into the Hydro One distribution grid. The output of the solar PV Project will be collected and connected to an electrical substation capable of transforming the power from distribution voltage to a transmission voltage of 230 kV. The proposed facility is to be known as the "Sol-luce Kingston Solar PV Energy Project" (hereinafter referred to as "the Project"). The Project is designated as a Class 3 solar farm as defined by Section 4 of O.Reg. 359/09.

Samsung and AMEC, its environmental consultant, have prepared this Draft Project Description Report to provide the public and interested agencies with an understanding of the plans for the Project. This Project Description Report has been prepared in accordance with the requirements for a Renewable Energy Approval. As the project design develops, this report will be updated with more detailed information.

1.2 Proponent

Samsung will be responsible for the design, construction, operation, and decommissioning of the proposed Project, and will be considered as the "proponent" for purposes of this Project. The proponent's office and contact information are as follows:

Simon Kim,
Deputy General Manager,
Samsung Renewable Energy Inc.
55 Standish Court, 9th Floor
Mississauga, ON
L5R 4B2

1.3 Consultant

AMEC Americas Limited has been retained to complete the preliminary engineering and the Renewable Energy Approvals application. The consultant's office and contact information are as follows:

AMEC Americas Limited 2020 Winston Park Dr., Suite 700 Oakville, ON L6H 6X7

Contacts: Peter Rostern: peter.rostern@amec.com (905) 568-2929

Robert Young: rob.young@amec.com (905) 568-2929





1.4 Schedule

The proposed schedule is to commence construction in the first half of 2013 with completion in 2014. Environmental studies of the area commenced in February 2011 and are ongoing.

1.5 Project Location

The proposed Project is to be located in the City of Kingston and Loyalist Township. Figure 1 shows the Project location in relation to Kingston, Odessa, and Highway 401. Figure 2 presents a more detailed image of the Project's boundaries.

The solar farm will be located on privately owned land. The Project's electrical substation will also be located on site. Overhead electrical connection lines will run to the Hydro One transmission line seen in Figure 2.

1.6 Regulatory Requirements

The Government of Ontario has committed to obtaining additional electricity supplies from renewable sources. This policy has recently been enacted into legislation with the Green Energy Act, 2009, which promotes the growth of clean, renewable sources of energy, like solar, to help Ontario become North America's leader in renewable energy. Amendments have been made to related legislation to complement the policies of the Green Energy Act and government approvals.

To regulate the environmental approvals requirements for a renewable energy project, the Province has enacted Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Environmental Protection Act (REA 2009). Samsung must obtain a Renewable Energy Approval from the Ontario Ministry of the Environment prior to developing the Project. The requirements for applying for a Renewable Energy Approval include consulting with stakeholders, completing studies of potential environmental effects, and providing detailed reports that cover the lifecycle of the Project.

A copy of Ontario Regulation 359/09 can be obtained from the following website:

http://www.e-laws.gov.on.ca/html/regs/english/elaws regs 090359 e.htm

As part of the application for a Renewable Energy Approval the proponent is required to submit a series of reports to support the approval. The key reports to be submitted are as follows:

- Project Description Report: The Project Description report will be the first document developed. This will describe components of the Project, its equipment and collection network and grid connection.
- Construction Plan Report: REA requires a plan for mitigation of construction impacts.





- Consultation Report: This will describe the public consultation, and meetings with stakeholders.
- **Decommissioning Plan Report:** The Decommissioning Plan Report will describe the method of demolition, disposal of the equipment, restoration of the site at the end of the Project life.
- Design and Operations Report: This will include design aspects and operational procedures that will mitigate environmental effects including monitoring and emergency response.
- Noise Report: Will provide predicted noise levels and effects.
- Cultural Heritage Report: Will describe the surrounding built environment and cultural features.
- Archaeological Report: This will include results of archaeological studies.
- Natural Heritage Assessment Report: This will document the studies of the natural environment and mitigation requirements.
- Water Assessment Report: This will be a supporting document describing water bodies within the Project setbacks.
- Water Bodies Report: This will be a supporting document describing effects on water bodies within the Project setbacks and mitigation.

The Project will be subject to numerous Provincial Permits and Authorizations as noted in the table below. It is not expected that the Project will require the involvement of federal agencies or require any federal approvals such as a Harmful Alteration, Disruption or Destruction of fish habitat that would trigger the need for an environmental assessment under Canadian Environmental Assessment Act.

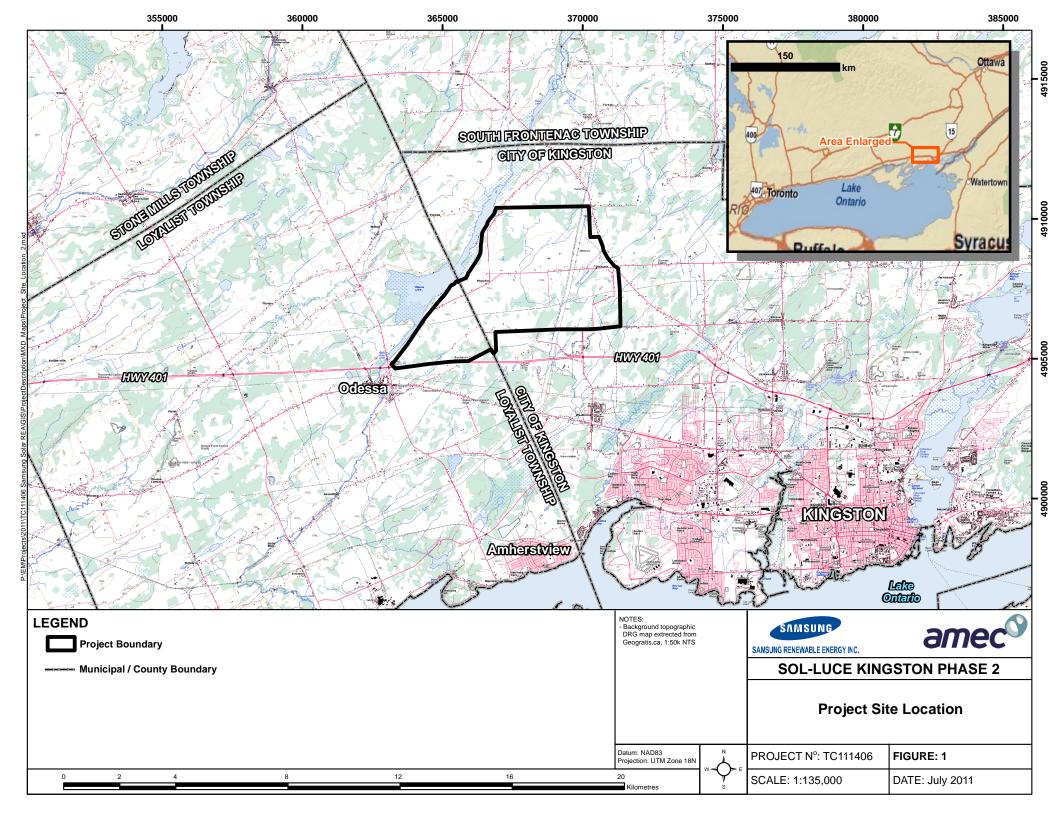
Table 1-1: Permits and Authorizations

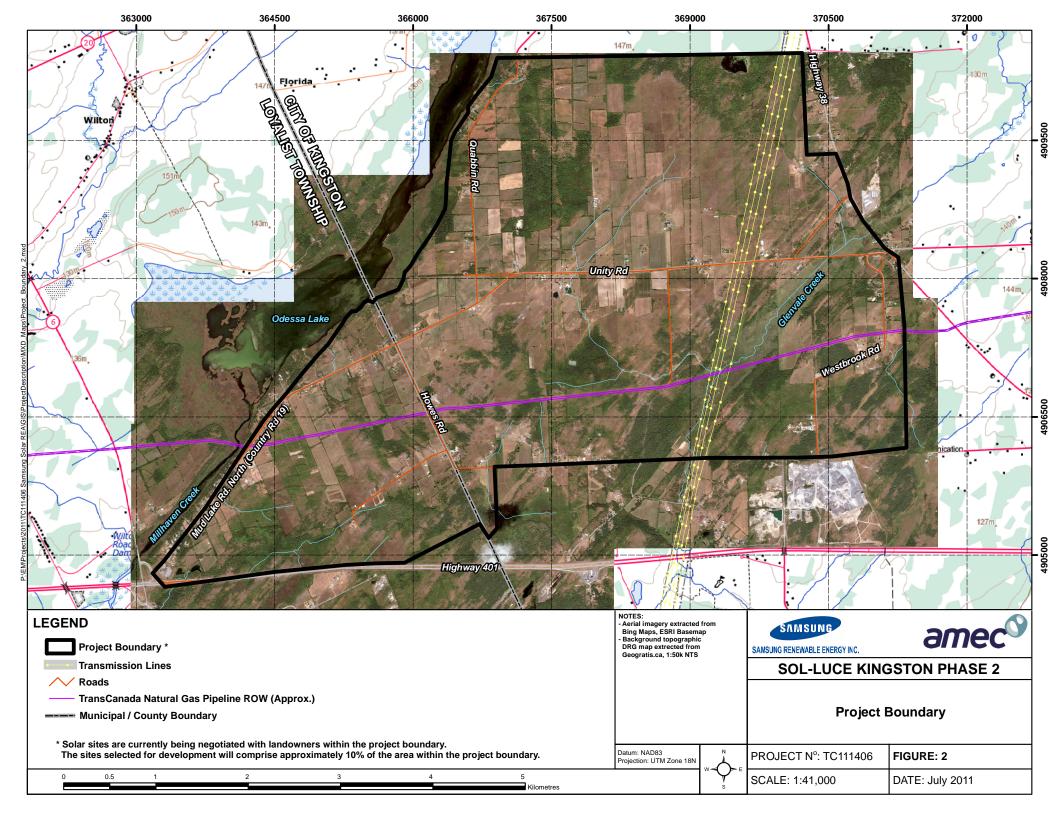
Permit/ Authorization	Issuing Authority and Point of Contact	Regulated Activity
Renewable Energy Approval	Ministry of Environment	Environmental approval of all Project works and activities.
Connection Approval System Impact Assessment	Independent Electricity System Operator	Required to register with IESO and meet requirements for grid connection.
Generator Licence	Ontario Energy Board	Permission to operate.
Customer Impact Assessment	Hydro One Networks	Effects of grid connection.
Certificate of Inspection	Electrical Safety Authority	High pressure systems require TSSA approvals.
Notice of Project Construction	Ministry of Labour	Required to meet labour codes and regulations.
Interference with Wetlands, and Alterations to Shorelines Permit	Conservation Authority	Development or works within floodplains such as water crossings.





Permit/ Authorization	Issuing Authority and Point of Contact	Regulated Activity
Work permit/agreement for municipal Right of Way	Municipality	Work within road allowance and use of road allowance for power lines
Building Permit		Need to meet local and provincial codes
Entrance Permit		Permission to connect to municipal roads









2.0 PROJECT DESCRIPTION REPORT REQUIREMENTS

Ontario Regulation 359/09 ("Regulation") sets out specific content requirements for the Project Description Report as provided in the following table. As this document will have a broad audience, a more comprehensive report has been prepared.

Project Description Report Requirements per Ontario Regulation 359/09

Set out a description of the following in respect of the renewable energy project:

- 1. Any energy sources to be used to generate electricity at the renewable energy generation facility
- 2. The facilities, equipment or technology that will be used to convert the renewable energy source or any other energy source to electricity
- 3. If applicable, the class of the renewable energy generation facility
- 4. The activities that will be engaged in as part of the renewable energy project
- 5. The name plate capacity of the renewable energy generation facility
- 6. The ownership of the land on which the project location is to be situated
- 7. Any negative environmental effects that may result from engaging in the project
- 8. An unbound, well marked, legible and reproducible map that is an appropriate size to fit on a 215 mm by 280 mm page, showing the project location and the land within 300 m of the project location.

The following sections are provided as per the regulation in the order required.

2.1 Energy Sources

The proposed Project would generate approximately 100 MWac of electricity to the Ontario electrical grid. The solar panels will be located on various sections of privately owned leased lands within the Project boundary shown in Figure 2, and will cover an area of approximately 325 ha.

2.2 Generation Equipment

The generation equipment will consist of fixed ground mounted photovoltaic panels to generate approximately 100MWac of power. The Project will use crystalline solar cells (solar panels). The panel manufacturer and model type has not yet been chosen. Additional information will be provided in subsequent issues of this Project Description Report as the design develops.

2.3 Class of Renewable Energy Generation Facility

Ontario Regulation 359/09 classifies various types of renewable energy facilities to determine the approval requirements. The Project is defined as a Class 3 (≥ 10 kW) ground mounted solar facility under Section 4 of the regulation based on the following criteria:





Class of Project

		Name plate capacity of solar facility (expressed in kW)
Class 3 At any a location other than mounted on the roof or wall of a building.		> 10

2.4 Project Development Activities

There are three phases in a solar farm Project lifecycle: construction, operation and decommissioning. Construction activities are short-lived, extending over a period of approximately one year. Once operational, the solar panels can be expected to be in service for at least 20 years, after which, a decision would be made whether to extend the life of the Project or to decommission.

In accordance with Ontario Regulation 359/09, separate detailed reports will be prepared to cover each of the phases of the Project as follows:

- Construction Plan Report;
- Design and Operations Report; and
- Decommissioning Report.

The activities under each of these phases are summarized in the following table.

Project Activities

CONSTRUCTION				
	Staking of site work area and installation of erosion and runoff controls			
	Construction of temporary access roads			
	Delineation of temporary work areas and installation of temporary construction facilities			
	Completion of necessary site grading			
Solar Farm Sites	Installation of vertical support beams			
Solar Farm Sites	Installation of solar panels			
	Connection of solar farm to electrical gathering system			
	Restoration of temporary work areas			
	Completion of permanent access roads			
	Landscaping (final grading, topsoil replacement, revegetation, fence installation, etc.)			
Gathering System	Installation of underground and/or above ground gathering lines on lease lands			





	1
	Installation of overhead and/or underground gathering lines on transmission line poles along municipal road rights-of-way
	Tree trimming and right-of-way clearing as required and approved by Municipality and/or Hydro One
	Installation of hydro poles within existing municipal road right-of-ways
	Installation of hydro poles for stream crossings
	Stringing and installation of the gathering line conductors
	Staking of site work area and installation of erosion and runoff controls
	Construction of temporary access roads
	Delineation of temporary work areas and installation of temporary construction facilities
Substation and Interconnection	Grading of substation site
interconnection	Construction of concrete footings and pads
	Installation of transformers and ancillary facilities
	Connection to Hydro One grid
	Commissioning of the Project
	OPERATION
	Periodic truck access for maintenance
Solar Panels	Routine maintenance and repairs
Solai Falleis	Meter calibrations
	Grounds keeping
	Periodic maintenance on gathering lines, interconnection and switchyard
Gathering Lines	Inspection and maintenance of condition of poles and lines annually
Switchyard	Tree trimming as required and approved by Municipality
and Interconnection	Switchyard vegetation control
	Testing and maintenance
	DECOMMISSIONING
	Removal of solar panels, support beams and all associated infrastructure
Solar Panels	Removal of foundations as agreed to or as necessary in accordance with the land lease agreement
	Site grading (dependent upon new proposed use)
Ooth only of the	Gathering line excavation and removal as necessary in accordance with the land lease agreement
Gathering Lines	Removal of interconnection lines and poles
	Site restoration
Switchyard	Removal of switchyard foundations, equipment and ancillaries as necessary in accordance with the land lease agreement
and Interconnection	Removal of grid interconnection
	Site restoration
	1





2.5 Name Plate Capacity

The proposed Project will have a nameplate capacity of approximately 100 MWac and will consist of solar panels (depending upon the panel manufacturer and technology chosen), covering approximately 325 ha. The actual electrical output at any specific time would vary, depending on solar intensity.

2.6 Land Ownership

The Project is spread across portions of City of Kingston and Loyalist Township as shown in Figure 2 and would occupy approximately 325 hectares. All of the land on which the solar panels would be located is privately owned and would be leased by Samsung for the duration of the Project.

Collector System lines are expected to follow existing road allowances from the solar panels to the Project substation. Some lines may share existing power poles or be installed on new poles.

2.7 Environmental Effects

The following table provides a summary of the potential environmental effects for the following environmental components as outlined in the REA Technical Bulletin One: Guidance for preparing the Project Description Report:

- Heritage and Archaeological Resources
- Natural Heritage Resources
- Water Bodies
- Air, Odour, Dust
- Noise
- Land Use and Resources
- Provincial and Local Infrastructure
- Public Health and Safety
- Areas Protected under Provincial Plan and Policies





Table 2-1: Project Environmental Effects

Environmental Component	Existing Environment	Potential Effects
Heritage and Archaeological Resources	A Stage 1 Archaeological Assessment was completed of the Project area. No registered archaeological sites have been registered within a radius of approximately one kilometre. Given all of the clear indications of archaeological potential for this property; however, this is likely more reflective of a paucity of archaeological assessments in the area than a lack of previous human occupation and use.	The Project does not involve the removal or alteration of heritage buildings or structures. Electrical gathering line works are proposed to occur predominantly within existing, previously disturbed road right-of-ways, thus reducing the potential for encountering previously undisturbed archaeological materials during gathering line construction.
	Recommendations have been made for a Stage 2 Archaeological Assessment of the sites that will be developed.	Excavation required for the installation of the solar panels, access roads, and temporary construction areas has the potential to disturb archaeological resources. No effects upon cultural or archaeological resources are anticipated during the operations phase of the Project.
Natural Heritage Resources	The majority of the study area consists of flat, cleared lands, with no identified significant landforms or topographic features. There are no Areas of Natural and Scientific Interest (ANSI's) in the study area. Two non-provincially significant wetlands are located in the proposed Project area. Several drainage features are located within the study area and flow southward towards Lake Ontario. The majority of the minor and intermittent	The greatest impacts of solar panels to wildlife are known to occur on bird species. Installation of the solar panels in existing agricultural fields would impact bird species that use agricultural field for foraging and protection; however, the impact would be localized (restricted only to the fields in which the solar panels are constructed). Construction of solar panels and ancillary facilities would have very little to no destruction and fragmentation of natural habitats, especially wetlands and woodlands.
	watercourses have been subjected to historic and recent channelization efforts, as well as the installation of tile drains.	Grassland breeding birds may avoid nesting in the vicinity of solar panels and may move to other nearby habitat.
	Detailed aquatic and terrestrial field surveys are currently being conducted within the Project site. The findings indicate	There was a lack of staging habitat for shorebirds and





Environmental Component	Existing Environment	Potential Effects
	that a wide variety of wildlife, including migratory bird species, utilize the Project site during some component of their life cycle. A complete list of species known to occur within the Project area, and the potential for Project-related effects on species of concern and their habitats, will be discussed in further detail in the final REA report.	waterfowl within the study area; therefore, the potential for impacts to these Orders of birds is minimal. Due to the lack of topographic features at the study site that would concentrate raptors, and the small number of raptors observed onsite, there is limited potential for raptor mortality
		as a result of the proposed Project. However, wintering and migrating Bald Eagles have been observed. The installation of new electrical generation and electrical transmission infrastructure may have the potential to affect Bald Eagles.
		Habitat loss due to the construction of access roads adjacent to woodland and thicket or in grassland habitats may result in some limited effects to wildlife; however, the post-construction periods and lack of noise disturbance would generally allow for the re-establishment of these habitat types.
		Traffic volumes, both during construction and during post- construction maintenance, are anticipated to be low and would not constitute a significant threat to mammals, reptiles and amphibians. Potential effects may result from construction and access road crossings of existing drainage features, which may represent amphibian habitat.
Water Bodies	Based on air photo interpretation and field reconnaissance, the Project area is drained by numerous water courses that report to Lake Ontario to the South. Glenvale Creek is the main watercourse within the Project boundary. Odessa Lake is the main water body to the west of the Project area.	There is potential for effects upon fisheries and surface waters due to destruction of fish habitat, sedimentation of waterways, or water contamination.
	is the main water body to the west of the Project area.	Operation of the solar farm facilities would likely not re-





Environmental Component	Existing Environment	Potential Effects
		any negative effects upon fisheries or surface waters. Conversely, improper construction of access roads, instream work for the purpose of installing overhead gathering lines, or the underground gathering lines could result in water quality impacts due to bank erosion, or improperly sized culverts.
		Aquifers can be susceptible to land use impacts depending on the type and thickness of the overburden and/or shallow depth to groundwater. Dewatering of aquifers is not anticipated as part of the Project development
Air, Odour, Dust	Air quality within the local airshed is expected to be of "good" to "very good", in part, due to the limited extent of urbanization, seasonality of agricultural activities, and climatic patterns of the area.	During construction, minor localized air emissions would occur from operating heavy equipment and temporary operation of generators. Additionally, construction-related traffic and various construction activities (e.g., excavation, grading) have the potential to create short-term nuisance dust effects in the immediate vicinity of the Project.
		Aside from the operation of maintenance vehicles, no other potential effects to air quality have been identified with the operation of the Project. The potential effects of these activities are similar to that of vehicles in Ontario for which standard emission controls are required.
Noise	The acoustic classification of the area is generally Class 3 (Class 3 refers to areas that are rural and/or small communities with a population of less than 1,000 and an acoustic environment dominated by natural sounds and little or no road traffic).	During construction, noise would be generated by the operation of heavy equipment at each site and associated vehicular traffic on-site. The audible noise at receptors beyond the construction area is expected to be a minor short-term disruption consistent with noise generated by any industrial construction Project or the operation of agricultural equipment.





Environmental Component	Existing Environment	Potential Effects
		During operations, no noise pollution would be emitted from the solar panels. Vehicular traffic associated with periodic maintenance visits would likely be the only source of noise.
Land Use and Resources	Existing land uses are agricultural. As much of the land in the project boundary has a soil rating of 4 or higher, the agricultural potential is limited. Consequently some of the land, which was previously farmed has been left fallow and has started to revegetate with trees and shrubs.	Solar panels will be located on lands with low agricultural potential with a soils classification of 4 or higher.
	Residential development in the area is sparse and typical of a rural area. The City of Kingston is the major populated center located to the south of Highway 401.	Solar farms are not contributors of noise or air emissions that affect residential communities.
	An area of the aggregate extraction is located to the southeast of the Project site.	The area of existing aggregate extraction is outside of the Project boundary.
Provincial and Local Infrastructure	Major highways include Highway 401 the south of the Project and Highway 38 to the east. County Road 19 is the most significant roadway within the Project study. The Project area is crossed by a Hydro-One transmission line right of way.	Lands for the access roads, electrical cable, electrical substation would be required for the Project lease period. During this time period, these lands would be removed from their present land-use and preclude the opportunity for the utilization of these lands for other land uses. Once the solar facilities are in operation, there would be some low level use of municipal services and facilities including roads. The transport of equipment and supplies to the Project construction sites during the construction phase would require additional temporary truck traffic to the solar sites and substation. The increase in traffic, may result in community disturbance typical of other construction. Impacts from increased traffic are not anticipated once the solar farms are in operation.





Environmental Component	Existing Environment	Potential Effects
Public Health and Safety	At present the area is rural in character with no major industrial emitters or noise sources that would affect air quality or cause nuisance effects. There are also no major traffic arteries within the Project boundary that would be a safety hazard.	General safety issues concerning the risk to public health and safety may occur during transportation of the solar panels and construction. These will largely be in the form of increased construction-related road traffic and the potential for unauthorized access of the public on the work site. Potential also exists for accidents and equipment malfunctions and thus there may be general public safety concerns regarding the new infrastructure. An operating solar farm is not expected to contribute greenhouse gases or other atmospheric pollutants in the course of electricity generation, and thus no public health concerns have been identified.
Areas Protected under Provincial Plan and Policies	The Project site is not within area of the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan Area, the Niagara Escarpment Plan Area or the Lake Simcoe Watershed Plan Area Greenbelt Plan	No impacts are expected to occur to areas protected under provincial plans and policies.





3.0 PUBLIC AND AGENCY CONSULTATION

A Notice of Proposal to Engage in a Project and Notice of Public Open House will be prepared and advertised in local newspapers and distributed to a list of public and industry stakeholders, including all landowners within 120 m of the Project location area. Extensive consultations with stakeholders including the public, interested organizations, and agencies will be conducted via:

- Direct mailings;
- Newspaper advertisements;
- Meetings with regulatory agencies and individuals;
- Two Public Open Houses;
- Direct stakeholder contacts;
- Project website; and
- Written correspondence.

The following government agencies are some of the agencies that have been contacted, or will be contacted as part of the public consultation for the Project:

City of Kingston	Cataraqui Region Conservation Authority
Loyalist Township	Ministry of Aboriginal Affairs
County of Lennox & Addington	Ministry of the Attorney General
Ministry of Natural Resources	Ministry of Municipal Affairs and Housing
Ministry of the Environment	Ministry of Agriculture and Food
Environment Canada	Ministry of Tourism and Culture
Indian and Northern Affairs Canada	Ministry of Transportation
Canadian Environmental Assessment Agency	

Consultations with the public, agencies, and Aboriginal communities will continue throughout the Project planning and development. Samsung will also complete two public open house sessions prior to submitting the application for a Renewable Energy Approval for the Project.





4.0 REFERENCES

REA 2009 - Ontario Regulation 359/09 - Renewable Energy Approvals Under Part V.0.1 of the Act made under the Environmental Protection Act.





5.0 CLOSURE

AMEC has completed this report for the exclusive use of Samsung for specific application to the Sol-luce Kingston Solar PV Energy Project. The work has been completed using generally accepted practices.

Sincerely,

AMEC Earth & Environment, a division of AMEC Americas Limited.

Matthew Evans, Ph.D. Senior Biologist

Matt Evans

Peter Rostern, P.Eng., MBA Principal Environmental Engineer