Water Body Environmental Impact Study
Westbrook Solar Energy Project

City of Kingston, Frontenac County, Ontario

March 2012

Prepared for:
SunEdison
595 Adelaide Street, Suite 400
Toronto, Ontario, M5A 1N8

Prepared by:
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Project No. 111-18734-00

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1 c Client
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GENIVAR

Project No. 111-18734-00

March 2, 2012

SunEdison Canada
595 Adelaide Street, Suite 400
Toronto, Ontario
M5A 1N8

Re: Water Body Environmental Impact Study
Westbrook Solar Energy Project
Part of Lots 4 and 5, Concession 5 WD
City of Kingston, Frontenac County, Ontario

Dear Sirs:

GENIVAR Inc. (GENIVAR) is pleased to provide you with a copy of our Water Body Environmental Impact Study for the Westbrook Solar Energy Project described as Part of Lots 4 and 5, Concession 5, Western Division of the City of Kingston, Frontenac County.

This report has been prepared in accordance with the requirements of an Environmental Impact Study (EIS) as outlined by Ontario Regulation 359/09 Renewable Energy Approvals made under the Environmental Protection Act (2009). This report identifies potential negative impacts relating to the form and function of an unnamed tributary of Glenvale Creek, an intermittent watercourse located within 120 m of the Project Location. Mitigative measures to eliminate or reduce impacts on this feature throughout the course of the development are also provided.

Thank you for the opportunity to complete this assignment. Please contact the undersigned if you have any questions.

Yours truly,
GENIVAR Inc.

Dan J. Reeves, B.Sc., M.Sc.
Project Biologist

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1. Introduction

GENIVAR Inc. (GENIVAR) has been retained by SunEdison Canada (SunEdison) to prepare a Water Body Environmental Impact Study as part of the Natural Heritage Assessment for the proposed Westbrook Solar Energy Project; herein referred to as the "Project Location". The report has been prepared in accordance with Ontario Regulation (O.Reg.) 359/09 Renewable Energy Approvals made under Part V.0.1 of the Environmental Protection Act (Government of Ontario (Ontario), 2009); herein referred to as the "REA Regulation". As stated in Sections 37 and 38 of the REA Regulation an Environmental Impact Study (EIS) must be prepared for all significant natural heritage features and water features on or within 120 m of the Project Location.

1.1 Project Location

The Project Location is approximately 100 acres (40.5 ha) in size and can be described as Part of Lots 4 and 5, Concession 5, Western Division of the City of Kingston, Frontenac County. It is located in a rural area characterized by early-mid successional mixed woodlands and cultural thickets on abandoned agricultural lands. It is bounded by Bur Brook Road West to the south, Westbrook Road to the east, and a hydro corridor to the west. An aggregate operation exists approximately 200 m to the southeast. The Glenvale Creek Wetland borders the Project Location to the north and northwest within the low-lying, poorly drained areas adjacent to Glenvale Creek. An unnamed tributary of Glenvale Creek exists within the southeast corner of the Project Location. Refer to Figure 1 for site location information.

2. Water Body Background Information

A review of background information performed by GENIVAR as part of the Water Body Records Review (2012) identified the presence of an unnamed tributary of Glenvale Creek within 120 m of the Project Location. Glenvale Creek, part of the Collins Creek subwatershed, flows in a roughly north to south direction and is located approximately 150 m west of the Project Location. The unnamed tributary of Glenvale Creek flows from a lowland forest northeast of the Project Location transversing the southeast corner of the Project Location. It has been identified as a seasonally intermittent watercourse that conveys spring surface run-off to Glenvale Creek approximately 1.5 km to the southwest. Glenvale Creek and its tributaries lie within the jurisdiction of the Cataraqui Region Conservation Authority.

A Water Body Site Investigation was conducted by Ecological Services during the 2011 field season. The following details have been drawn from the Water Body Site Investigation report (Ecological Services, 2011). During the April 2011 site visit, flow was observed within the unnamed tributary, but the channel was dry when surveyed in June 2011. Within 120 m of the Project Location, the channel was approximately 1-2 m wide and 20-30 cm deep in the centre of the channel. There were no established aquatic vegetation communities along the channel, and most of the tributary existed as a grassy swale. Sedges and rushes were observed in isolated pockets along the creek where soils were moist during each of the site visits. There were no fish observed within the channel during the site visits; however, several frogs were noted within 30 m of the channel during the April 2011 site visit. Flows within the creek were assessed to occur only during the spring melt and were deemed insufficient to provide suitable direct habitat for fish. The unnamed tributary of Glenvale Creek was assessed to be a seasonally intermittent watercourse that does not support direct fish habitat, at least within the reach that lies adjacent to the Project Location.

3. Environmental Impact Study

3.1 Water Body EIS Report Updates

A Natural Heritage Assessment Environmental Impact Study (EIS) Report has been prepared for the Westbrook Solar Energy Project by Ecological Services (2012). Within the EIS report, an assessment of potential impacts to the seasonally intermittent unnamed tributary of Glenvale Creek are provided along with several recommendations for mitigation during the construction and decommissioning phases of the project. This report provides further assessment of the potential negative impacts to this watercourse and recommendations for mitigation measures to avoid, reduce or eliminate impacts of the proposed development.

3.2 Requirements of the EIS

Section 40 (1) of the REA Regulation, which specifies prohibitions associated with water bodies, prohibits the construction, installation or expansion of a renewable energy project, or part thereof, within the following locations:

- 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;
- within 300 metres of the average annual high water mark of a lake trout lake that is at or above development capacity;
- within 120 metres of the average annual high water mark of a permanent or intermittent stream; and/or,
- within 120 metres of a seepage area.

Should one of these water bodies exist within 120 m of the Project Location, an EIS report must be prepared, which:

- identifies and assesses any negative environmental effects of the project on each water body and land within 30 metres of each water body;
- identifies appropriate mitigation measures to avoid, reduce or eliminate any negative environmental effects on each water body;
- describes how the environmental effects monitoring plan set out in the Design and Operations Report addresses any negative environmental effects; and
- describes how the Construction Plan Report addresses any negative environmental effects.

As identified in the Water Body Records Review (GENIVAR, 2012) and the Water Body Site Investigation Report (Ecological Services, 2011), the Project Location exists within 120 m of the average annual high water mark of a permanent or intermittent stream.

3.3 Assessment of Potential Impacts and Mitigative Measures

According to the requirements outlined within O.Reg 359/09, Section 38, an Environmental Impact Study (EIS) is required prior to approval of this project. The purpose of an EIS is to identify the presence of natural heritage features and water bodies on or adjacent to the proposed development, and to identify potential impacts relating to the loss of ecological form or function. Mitigative measures to eliminate or

reduce impacts on identified natural heritage features or functions must then be developed. This report has been prepared to address the requirements for the construction of the proposed Westbrook Solar Energy Project within 120 m of an unnamed tributary of Glenvale Creek, a seasonally intermittent stream. Based on field observations and an assessment of the available habitat conducted by Ecological Services (2011), this watercourse is not considered to support fish habitat.

3.3.1 Potential Impacts to Surface Water Features

Potential impacts to the hydrological form and function of the tributary of Glenvale Creek may occur during the construction and decommissioning phases of the project. During the construction phase impacts may arise due to vegetation removal, grading and trenching, and resulting changes to surface water drainage and dust generation. No development is scheduled within 30 m of the intermittent tributary of Glenvale Creek; however, if necessary, trees within 30 m of the watercourse may be removed to reduce shade impacts on the adjacent solar panels (Ecological Services, 2012). All shrubs and herbaceous vegetation within the buffer area will be retained. Anticipated impacts during the decommissioning phase are likely to be similar to those for the construction phase.

3.3.2 Mitigation Measures

The OMNR recommends the establishment and/or retention of natural vegetated cover for the protection of surface water features. Recommended buffer widths range from 15 m to 30 m depending on the proposed development and the nature of the ecological system in question (OMNR 2010). The tributary of Glenvale Creek transverses the southeast corner of the Project Location. There is no development proposed within 30 m of this feature, thereby satisfying the more conservative 30 m buffer required for sensitive systems. Further to this, to ensure that the form and function of the surface water feature is not negatively impacted by the proposed development, the following mitigation measures are recommended:

- A naturally vegetated buffer should be established or maintained between the proposed development and the intermittent watercourse to reduce or eliminate increased turbidity due to the transport of sediments, nutrients and contaminants into the watercourse. The existing 30 m vegetated buffer will provide suitable separation between the proposed development area and the tributary of Glenvale Creek. This vegetated buffer will help to ensure that changes to surface water run-off, water temperature and overall productivity of the watercourse are minimized. Existing vegetation types may be used as a vegetated buffer, or planted vegetation may act as a buffer in conjunction with existing habitat. If tree removal is necessary it should be conducted when the channel is dry thereby reducing the potential for increased erosion and sediment transport within the watercourse.
- Temporary siltation fencing should be utilized during the construction and decommissioning phases of the project between the areas of proposed development and the tributary of Glenvale Creek, to reduce or eliminate the transport of sediments, nutrients, contaminants, and increased turbidity within this feature. Siltation fencing should be installed before any work on the Project Location begins, and removed after the threat of siltation effects has ceased. The siltation fencing should be checked periodically during the construction and decommissioning phases to ensure it remains in good condition. Further details concerning the quality and installation of suitable erosion control fencing is provided in the Draft Natural Heritage Assessment Environmental Impact Study Report (Ecological Services, 2012).
- Grading activities should aim to minimize changes in land contours and natural drainage in order to reduce the potential for changes to hydrological patterns.

- The Construction Plan Report should identify control measures for appropriate equipment maintenance and fuelling during the construction and decommissioning phases of the project. Storage of fuel should not be permitted on-site. Emergency spill kits should be maintained on-site in case of emergency.

4. Conclusions and Recommendations

The following conclusions and recommendations are provided based on the findings presented in this report:

- A seasonally intermittent tributary of Glenvale Creek transverses the southeast corner of the Project Location. Based on a review of available information and a site investigation performed by Ecological Services (2011), this watercourse is assessed to be unsupportive of fish habitat.
- There are no development activities scheduled within 30 m of the tributary of Glenvale Creek.
- If necessary, trees within 30 m of the watercourse may be removed to reduce shade impacts on adjacent solar panels. Tree removal should occur during periods when the channel is dry.
- Mitigation measures identified under Section 3.3.2 of this report should be reviewed and appropriately implemented.

5. Closure and Limitations

This report has been prepared by GENIVAR Inc. The assessment and recommendations within are based solely on the information referenced and contained within the report. GENIVAR does not assume responsibility for the accuracy of material presented within the information sources used in the preparation of this report. GENIVAR has not been to the Project Location, and was not involved in any of the field components of this study. While we have outlined the best management practices for dealing with surface water features within the area of influence of a solar energy project, we cannot conclude unequivocally that there will be no negative impact to the ecological form or function of this feature.

Thank you for the opportunity to complete this report. We trust that this information is satisfactory for your current requirements. Please contact us if we can be of further assistance.

Report Prepared by:
GENIVAR Inc.

Erin Corstorphine, M.Sc.
Biologist

Reviewed by:

Dan Reeves, M.Sc.
Project Biologist

6. Literature Cited

Ecological Services. 2011. Water Body Site Investigation Report for SunE Westbrook Solar Energy Project. October 12, 2011.

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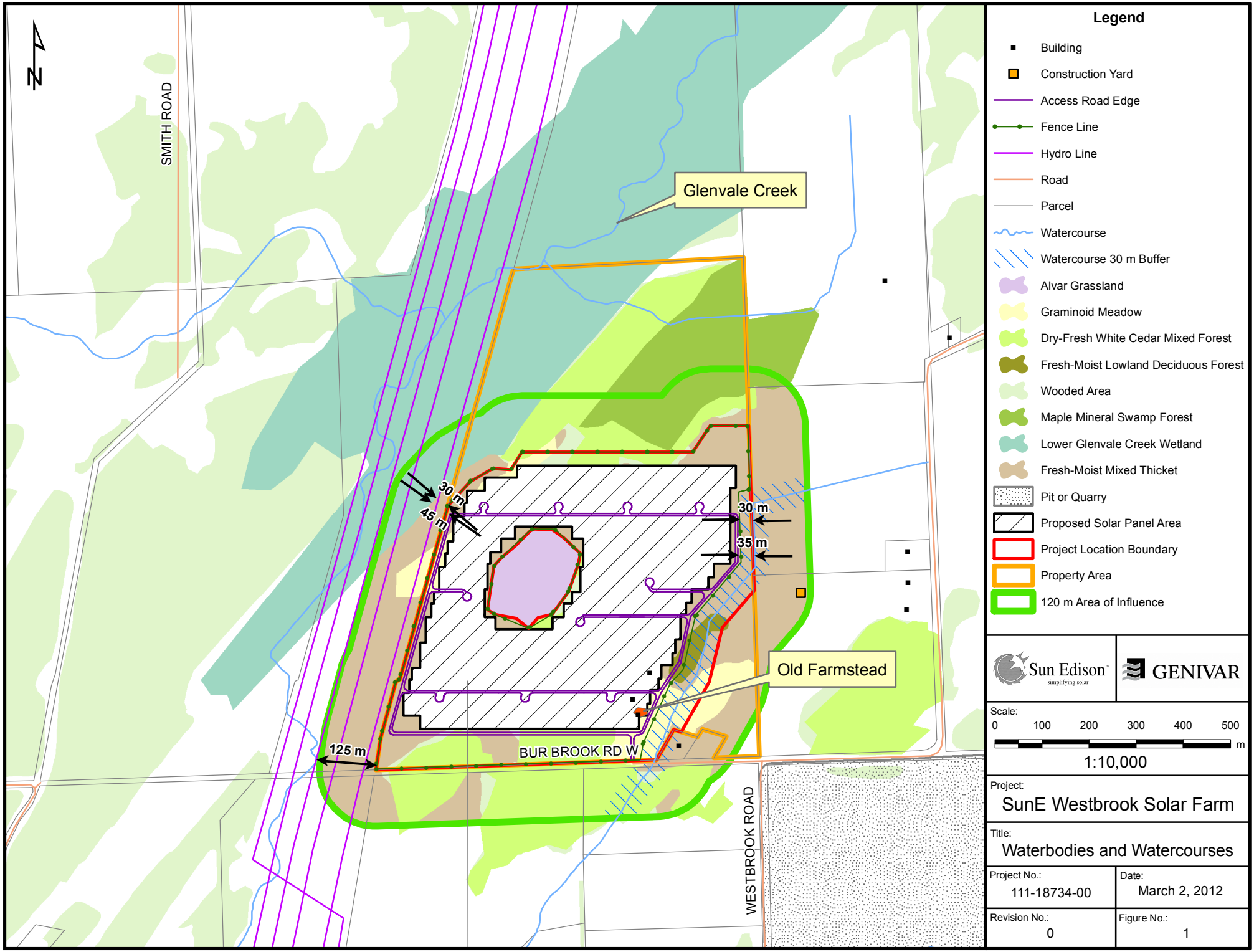
Figures


N
SMITH ROAD
Glenvale Creek
30 m
45 m
30 m
35 m
Old Farmstead
125 m
BUR BROOK RD W
WESTBROOK ROAD
Legend
Building
Construction Yard
Access Road Edge
Fence Line
Hydro Line
Road
Parcel
Watercourse
Watercourse 30 m Buffer
Alvar Grassland
Graminoid Meadow
Dry-Fresh White Cedar Mixed Forest
Fresh-Moist Lowland Deciduous Forest
Wooded Area
Maple Mineral Swamp Forest
Lower Glenvale Creek Wetland
Fresh-Moist Mixed Thicket
Pit or Quarry
Proposed Solar Panel Area
Project Location Boundary
Property Area
120 m Area of Influence
Sun Edison
simplifying solar
GENIVAR
Scale:
0 100 200 300 400 500
m
1:10,000
Project:
SunE Westbrook Solar Farm
Title:
Waterbodies and Watercourses
Project No.:
111-18734-00
Date:
March 2, 2012
Revision No.:
0
Figure No.:
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