

**PROPOSED ST. CLAIR MOORE
SOLAR FARM
LAMBTON COUNTY, ONTARIO
ENVIRONMENTAL IMPACT STUDY**

**Submitted to:
First Solar Development (Canada) Inc.
400 Somerset, Corporate Boulevard
Bridgewater, NJ 08807
USA**

**Submitted by:
AMEC Earth & Environmental
a division of AMEC Americas Limited
870 Confederation Street
Sarnia, Ontario
N7T 2E5**

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SW04090562

TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION.....	1
1.1 Project Development Proposal	1
2.0 RENEWABLE ENERGY APPROVALS (ONTARIO REGULATION 359/09)	3
2.1 Natural Heritage	3
2.1.1 Records Review	3
2.1.2 Site Investigation.....	5
2.1.3 Determination of Significance	6
2.1.4 Confirmation From MNR	6
2.2 Water	6
2.2.1 Records Review	6
2.2.2 Site Investigation.....	7
3.0 EXISTING NATURAL ENVIRONMENT	8
3.1 Site Geology	8
3.2 Soil and Groundwater Quality.....	8
3.3 Surface Water Drainage	9
3.4 Terrestrial Ecosystem Existing Conditions	9
3.4.1 Methodology	9
3.4.2 Wildlife Communities	10
3.4.3 Natural Heritage Features.....	10
3.5 Land Use	11
4.0 POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION	13
4.1 Mitigation Methods and Significance of Residual Impacts	13
4.1.1 Construction Phase.....	13
4.1.2 Operations Phase	14
5.0 CONCLUSIONS.....	16
6.0 CLOSURE.....	17

TABLE OF CONTENTS (cont)

PAGE

LIST OF TABLES

Table 1 - NHIC/SARA Listed Species Located Near the Project Site	11
Table 2 - Potential Project-Environment Interactions	13

LIST OF FIGURES

Figure 1 – Project Development Plan
Figure 2 – Natural Heritage Constraint Plan (2007 NHIC Data)
Figure 3 – Historical Oil and Gas – St. Clair Moore Site

LIST OF APPENDICES

Appendix A – Site Photographs
Appendix B – St. Clair Region Conservation Authority – Forest Inventory
Appendix C – St. Clair Region Conservation Authority – Drainage Classification Maps

1.0 INTRODUCTION

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC) was retained by First Solar Development (Canada) Inc. (First Solar) to conduct an Environmental Impact Study (EIS) for a proposed photovoltaic (solar) electrical power generating facility, the St. Clair Moore Solar Farm (Solar Farm), at a site located in St. Clair Township in the County of Lambton in southwestern Ontario. The proposed site is identified as Part Lots 25 and 26 Concession 9, St. Clair Township in the County of Lambton. The site area is approximately 120 hectares (ha) (of which 56 ha would be utilized for solar arrays) and is currently in agricultural use (Figure 1).

This EIS intends to provide a detailed summary of the natural features assessment and water bodies assessment as required by Ontario Regulation 359/09 (O.Reg. 359/09) Renewable Energy Approvals made under the *Environmental Protection Act*. Specific objectives of the EIS were to evaluate the presence or absence of natural features and water bodies near the development site and determine the distance to the development from the features, if present. It should be noted that the Solar Farm is not located within the Oak Ridges Moraine planning area or the Niagara Escarpment planning area and as such, no further discussion of these features or their respective planning areas will be included in the EIS.

It should also be noted that this EIS does not address the archaeological or cultural heritage resources in the area of the development. The archaeological and heritage assessments are presented in separate documents prepared by others on behalf of First Solar.

1.1 Project Development Proposal

First Solar hopes to initiate construction of its Solar Farm in late 2010 and plan to have the development operational by the end of 2011. The proposed facility will be designed to convert sunlight to electricity through a photovoltaic process thereby providing a renewable source of electricity to the local power grid. The Solar Farm will utilize highly-efficient and proven passive technology to generate up to approximately 20 MW/ac of power for delivery to the transmission grid.

The Project site is located on Part Lots 25 and 26, Concession 9, St. Clair Township and encompasses an area of approximately 120 ha, which is currently in agricultural use. Photographs of the proposed development site are presented in Appendix A. The Project requires approximately 72 ha for array construction; roadways and other facilities with the remaining area will be undeveloped with portions utilized for a short period during construction. The site lies in a mixed residential, agricultural and industrial land use within St. Clair Township. Figure 1 presents the project site location and preliminary facility layout.











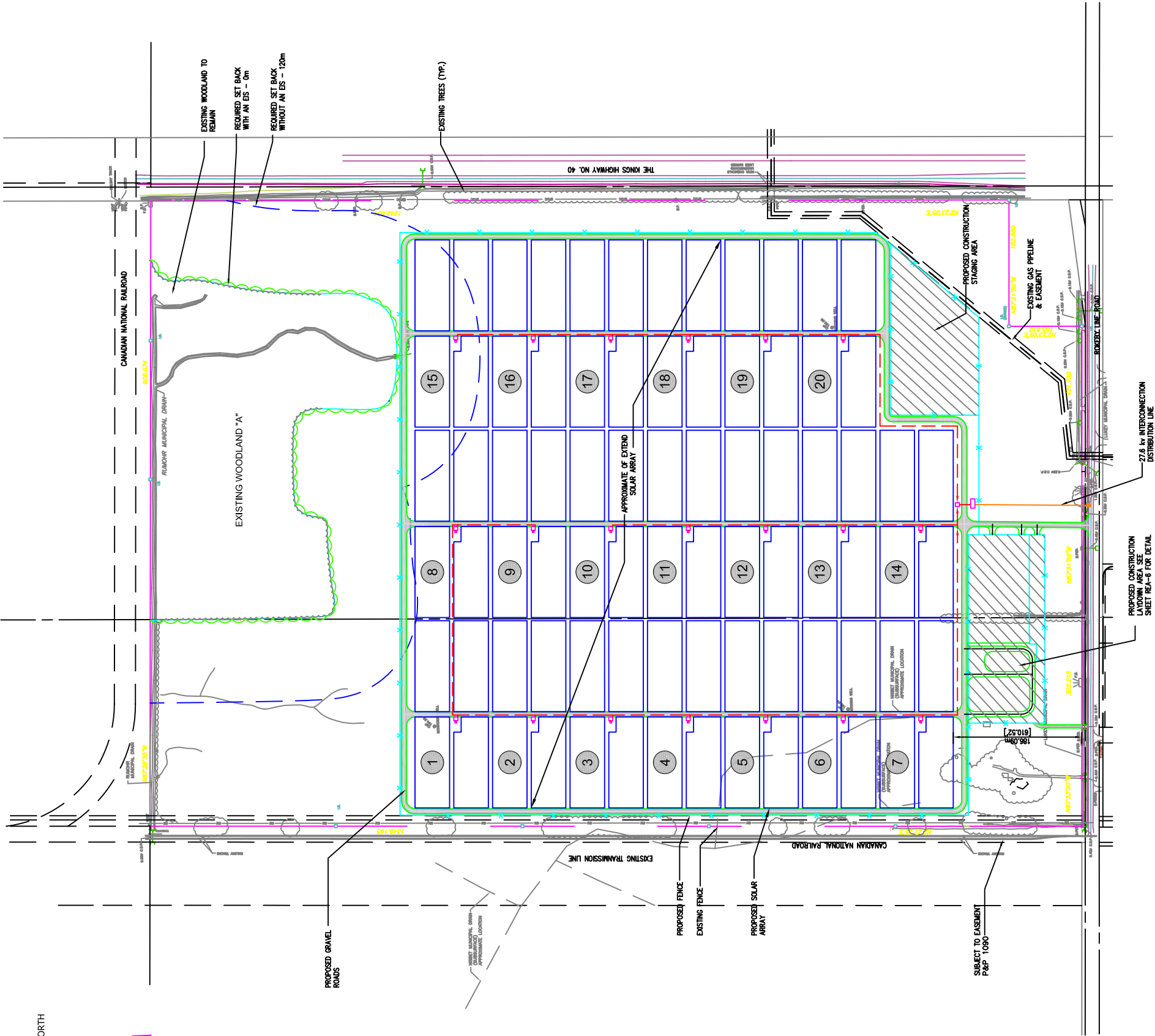
ARRAY PERSPECTIVE

NOTES:

1. ALL CONSTRUCTION SHALL BE OFFSET A MINIMUM OF 1 METER OFF OF THE EXISTING GAS PIPELINE EASEMENTS.

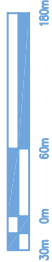
LEGEND:

	PROPERTY BOUNDARY
	ARRAY BOUNDARY
	AC ELEC. (UNDERGROUND)
	AC ELEC. (OVERHEAD)
	PROPOSED FENCE
	RAILROAD
	GAS LINE
	EXISTING TREE LINE



SITE IMPROVEMENT PLAN

SCALE: 1m : 3000M

[illegible]

The site is bound by woodlands and a rail shunting and storage operation to the north, Highway 40 to the east, Rokeby Line to the south and railway corridor and agricultural field to the west. The property is located approximately 3.25 km southeast of the Town of Corunna. The Project's access drive will enter off Rokeby Line.

As part of the solar farm development, First Solar is also considering additional options for the on-going encouragement of the natural communities and visual impacts around the Site. One of these current considerations being looked at include the addition of new woodlot (at and around perimeter of existing woodlot land) as part development plan to encourage plant and wildlife viability and sustainability along the north of the Site and reinforce the already existing natural buffer area which exists on and adjacent to the Site boundary.

There is one residential dwelling with associated structures (barn and silo) located along the southwest portion of the development Site, along Rokeby Line, to the north (Figure 1). This structure is inferred to have been utilized for historical farming efforts on the Site.

2.0 Renewable Energy Approvals (Ontario Regulation 359/09)

The purpose of this report is to provide an EIS in support of obtaining approval for the project under O.Reg. 359/09 Renewable Energy Approvals of the *Environmental Protection Act*. According to O.Reg. 359/09, the Solar Farm is considered to be a Class 3 solar facility as it has a name plate capacity of greater than 10 kW. This EIS has been undertaken specifically to address the requirements outlined in Sections 24 to 31 of O.Reg. 359/09.

In addition to the land use planning process reported herein, the facility will also require permits issued by the Ontario Ministry of Environment. Under this permitting process, the Ministry of Natural Resources and the St. Clair Region Conservation Authority have also been contacted for consultation with approvals pending upon their review. It is understood that additional review by government stakeholders may drive the need for additional assessment.

2.1 Natural Heritage

2.1.1 Records Review

As required by O.Reg. 359/09, in order to identify whether the Solar Farm is located in a natural feature; within 50 m of an area of natural or scientific interest (ANSI) related to earth science; or within 120 m of a natural feature that is not an ANSI related to earth science; AMEC reviewed the availability of information from following sources (if applicable):

- Provincial Parks/conservation reserves
 - Not applicable – no provincial parks or conservation reserves are located within 120 m of the proposed development area;
- Ontario Ministry of Natural Resources
 - A search of the MNR Natural Heritage Information Centre (NHIC) website and database;
 - Meeting with MNR personnel on 2 December 2009 to obtain additional information on species at risk, ANSI, and any other information that may be applicable to the development site;
 - Response from the MNR on 11 January 2010 confirming no additional information found regarding additional information on species at risk, ANSI, or other natural features at or near the development site beyond preliminary information submitted 2 December 2009;
- Crown in Right of Canada
 - Not Applicable – Proposed Development is not on, or within 120 m of any Crown Land;
- Conservation Authority
 - St. Clair Region Conservation Authority (SCRCA) personnel were contacted to request information related to their knowledge of the presence of any ANSI near the proposed development site;

- Local and Upper-Tier Municipality
 - St. Clair Township and the County of Lambton are the municipal bodies responsible for the proposed development site and was contacted to request information related to the presence of any ANSI near the proposed development site;
- Planning Board
 - Not Applicable – St. Clair Township and the County of Lambton are the municipal bodies responsible for the proposed development site;
- Municipal Planning Authority
 - Not Applicable - St. Clair Township and the County of Lambton are the municipal bodies responsible for the proposed development site;
- Local Roads Board
 - Not Applicable - St. Clair Township and the County of Lambton are the municipal bodies responsible for the proposed development site;
- Local Services Board
 - Not applicable;
- Niagara Escarpment Commission
 - Not applicable

It should be noted that although a number of the above agencies were contacted to obtain information related to natural features, or areas of natural or scientific interest, most deferred to the Ontario Ministry of Natural Resources as being the primary authority for this information.

Although the records review did not identify any natural features, areas of natural or scientific interest or any species at risk within 120 m of the proposed development site the following records from the NHIC database were reviewed as the closest data points observed relative to the Site:

- One ANSI area (Stag Island) was identified as being present to the north and west of the Site, respectively at a distance greater than 120 m and upwards of 3 kilometres (km);
- One Provincial wetland (Stag Island) was identified as being present to the north and west of the Site, respectively at a distance greater than 120 m and upwards of 3 km; and
- Two rare fish species (the closest identified species on the NHIC website), namely the American Brook Lamprey and Spotted Sucker were identified as being present in areas greater than 120 m from the proposed development site.

In addition to the NHIC database and website available to the public, the SCRCA authority provided an updated table of NHIC information from the MNR with 2008 species data. The additional noted data identified 11 additional species in the general area of the Solar Farm site. After reviewing the table and location blocks, it appears that all noted additional species

provided by the SCRCA would fall not only outside of 120 m from the proposed development site, but greater than 1 km. The response received from the MNR on 11 January 2010 detailing Species at Risk, did not note any species of concern at the project Site.

Figure 2 presents the current NHIC information available on the MNR and their website posted data.

2.1.2 Site Investigation

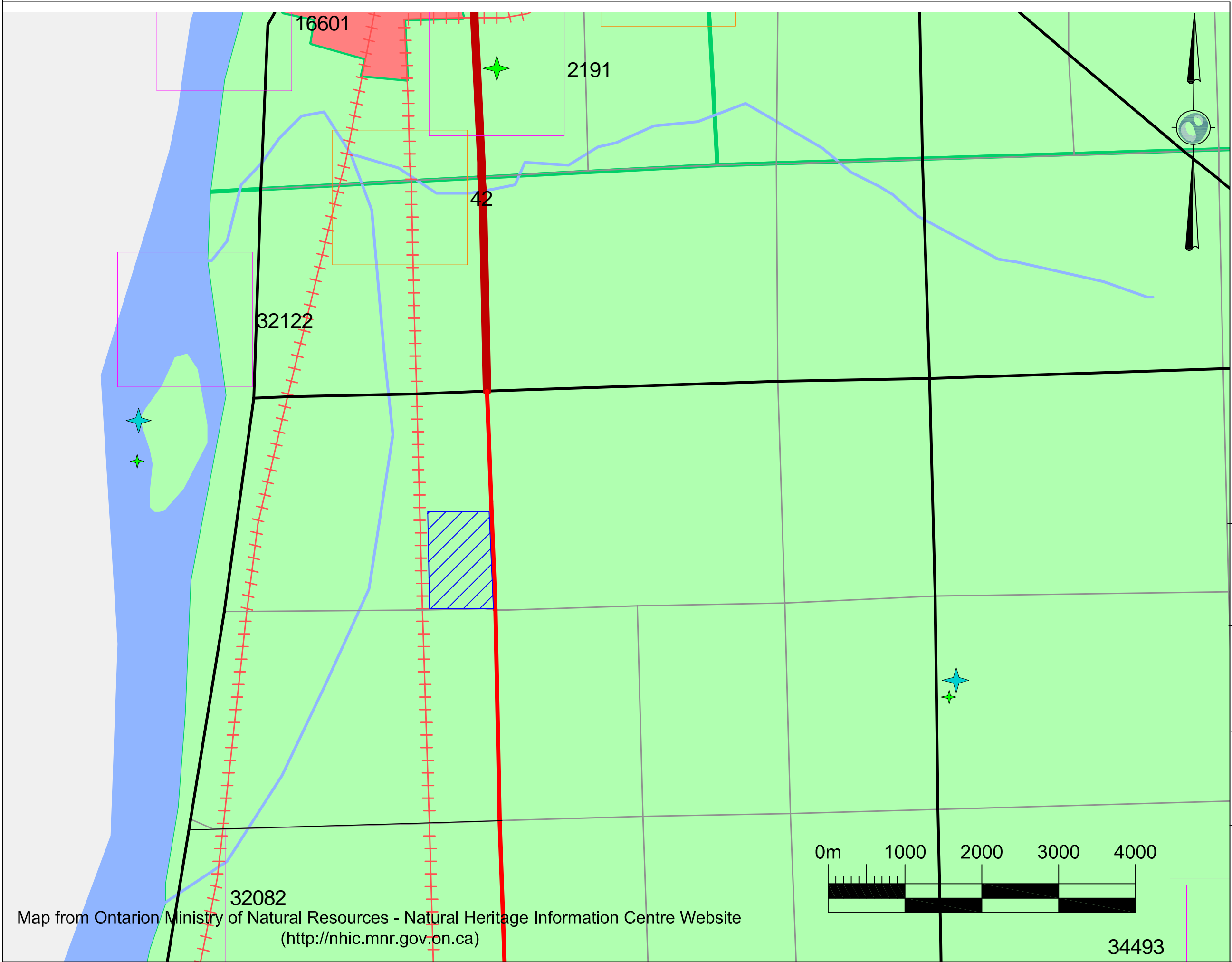
A site investigation was undertaken on 27 September 2009 by AMEC personnel with a follow-up Site reconnaissance conducted on 7 December 2009. The site investigation focused on a woodlot located along the central portion of the northern property boundary and onto the adjacent property. The woodlot can be observed in Figure 1. This woodlot is approximately 12 ha in size does meet the criteria to be considered a woodlot under O.Reg. 359/09 or Schedule H of the Official Plan for the County of Lambton and as such has been included as a natural feature in this report.

As part of the preliminary Site assessment and review activities, a copy of a forest inventory was obtained by the SCRCA for the Woodlot at the Site. This information will be utilized in the completion of an updated woodlot assessment study planned for the Site in the coming months. The updated woodlot study will be completed and prepared using the protocols established by the Ecological Land Classification (ELC) system for Southern Ontario (Lee et al., 1998). Lists of all plant and wildlife species observed will be compiled. Data recorded will include species composition, approximate size, age, health and condition of trees. Completed details of the site investigation will be presented in the document and appended to a final version of EIS to complement the SCRCA inventory and assessment previously completed. Woodlot information is available under Appendix B.

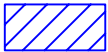
In the woodlot report prepared by the SCRCA, no direct evidence of mammals were encountered; though a stick nest in a white oak tree was observed that may be a nesting for a red tailed hawk (*Buteo jamaicensis*), common in the area. In addition features of the woodlot would be expected to support and contribute to the nesting of varying wildlife.

As noted above, the site investigation identified a woodlot located on-site, and within 120 m of the proposed development (immediately adjacent to the proposed development). Full details of the woodlot study (once completed) including the field notes prepared by AMEC field staff will be presented in Appendix B, along with the findings of the existing woodlot assessment prepared by the SCRCA. A summary of the woodlot details available to date are as follows:

- Type – Hardwood Forest



LEGEND:



Approximate Site Area

- Ont. Living Legacy Sites (Proposed)
- Conservation Reserve
- Enhanced Management Area
- Forest Reserve
- Provincial Park
- Others
- Main Lakes
- Lakes and Rivers
- Islands

- Rare Species Locations
- Endangered
- Threatened
- Vulnerable
- Others
- Vegetation Communities

- Natural Areas
- Earth Science ANSI
- Life Science ANSI
- Conservation Area
- Life Science Site
- National Park
- Provincial Park
- Prov. Park Zone
- Wetland
- All Others

- Main Roads
- 4-Lane Hwy.
- Prov. Hwy.
- County Rd.
- Other Roads

- Railways

- Provincial Parks
- Historical
- Nature Reserve
- Recreation
- Waterway
- Wilderness
- Natural Environment
- Cities, Towns and Villages
- Townships

TITLE:

FIGURE 2
HERITAGE CONSTRAINTS
MAP - ST CLAIR MOORE SITE

CLIENT:

FIRST SOLAR
DEVELOPMENT CANADA

PROJECT:

PROJECT #: SW04090562
DRAWN BY: MC
DATE: NOVEMBER 2009
SCALE: AS SHOWN

PREPARED BY:



870 Confederation St
Sarnia, Ontario
N7T 2E5
Ph: 1-519-337-5409
Fax: 1-519-337-2514

- Attributes – 12.0 ha in area, mixed deciduous
- Composition – ELC classification is Bur oak (*Quercus macrocarpa*), Hard Maple (*Acer saccharum*), White Oak (*Quercus alba*), White and Green Ash (*Fraxinus americana* and *Fraxinus pennsylvanica*, respectively), Basswood (*Tilia americana*) and White Elm (*Ulmus americana*) are the dominant tree species.

2.1.3 Determination of Significance

Based upon the results of the records search and the site investigation, the woodlot located on, and adjacent to, the proposed development property has been identified as meeting the criteria for significance as defined in Section 8 of the Official Plan for the County of Lambton. No other features were identified on the property as being significant, or provincially significant.

2.1.4 Confirmation from MNR

A response was received from the MNR on 11 January 2010 indicated that there were no Element Occurrences ("EO") or known Species at Risk at, or near, the development Site.

2.2 Water

2.2.1 Records Review

As required by O.Reg. 359/09, in order to identify whether the Solar Farm is located in a water body; within 120 m 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 m of the average annual high water mark of a lake trout lake that is at or above development capacity; within 120 m of the average annual high water mark of a permanent or intermittent stream; or within 120 m of a seepage area; AMEC reviewed the availability of information from following sources (if applicable):

- Provincial Parks/conservation reserves
 - Not applicable – no provincial parks or conservation reserves are located within 120 m of the proposed development area;
- Ontario Ministry of Natural Resources
 - A search of the MNR Natural Heritage Information Centre (NHIC) website and database;
 - Meeting with MNR personnel on 02 December 2009 to obtain additional information on water bodies, and any other information that may be applicable to the development site;
 - MNR indicated that they would defer to the St. Clair Region Conservation Authority's setback distances and requirements under the *Conservation Authorities Act*;
- Crown in Right of Canada

- Not Applicable – Proposed Development is not on, or within 120 m of any Crown Land;
- Conservation Authority
 - St. Clair Region Conservation Authority (SCRCA) personnel were contacted to request information related to their knowledge of the presence of any water bodies near the proposed development site;
 - Response from the SCRCA indicates that the drainage system present at the development site is subject to Ontario Regulation 178/06 (O.Reg. 178/06) of the *Conservation Authorities Act*.
 - The SCRCA has provided information related to the setbacks required under O.Reg. 178/06. According to the SCRCA, the Site does not fall within a flood concern zone. In addition, the array development plan includes all work outside of the 30m setback required under the REA.
- Local and Upper-Tier Municipality
 - The County of Lambton and St. Clair Township are the municipal bodies responsible for the proposed development site and were contacted to request information related to the presence of any water bodies near the proposed development site;
 - Response from the St. Clair Township/County of Lambton Senior Planner and Drainage Superintendent indicated that the drains on the proposed development property are municipal drains and are maintained by the municipality;
- Planning Board
 - Not Applicable - St. Clair Township and the County of Lambton are the municipal bodies responsible for the proposed development site;
- Municipal Planning Authority
 - Not Applicable – St. Clair Township and the County of Lambton are the municipal bodies responsible for the proposed development site;
- Local Roads Board
 - Not Applicable - St. Clair Township and the County of Lambton are the municipal bodies responsible for the proposed development site;
- Local Services Board
 - Not applicable;
- Niagara Escarpment Commission
 - Not applicable

2.2.2 Site Investigation

A site investigation was undertaken as part of a concurrent stormwater management site visit. The site investigation and review of information available from the SCRCA and St. Clair Township identified the presence of four drains in the general vicinity of the project site.

The Rumohr (open ditch), Nesbit Award (tile drain circa 1916) and Lukey Drains (open ditch) are located adjacent/along the Site's northern, western and southern property boundaries,

respectively. These three drains are inferred transfer water from the site and surrounding properties into the Baby Creek Drain located approximately 300 m west of the Site and eventually conveying the water into the St. Clair River. The Allingham Drains was observed to be located generally within 50 m west of the Site northwest corner and 400 metres of the Site's northern boundary. Water entering the Allingham Drain is inferred to be directed into Marsh Creek located 800 m north and west of the project site.

Evidence of a below-grade drainage tile/features were observed transecting the Site, and based on the agricultural development of the Site area would be assumed that the Site tiling carrier the majority of Site infiltration runoff water into both the Nesbit Award and Lukey Drains, with a portion of surficial drainage water in the northwest portion of the Site being directed to the Rumohr drain.

No other water bodies were identified on the site as part of the site investigation. There are no lakes, Lake Trout lakes, streams, or rivers present on the property.

3.0 EXISTING NATURAL ENVIRONMENT

3.1 Site Geology

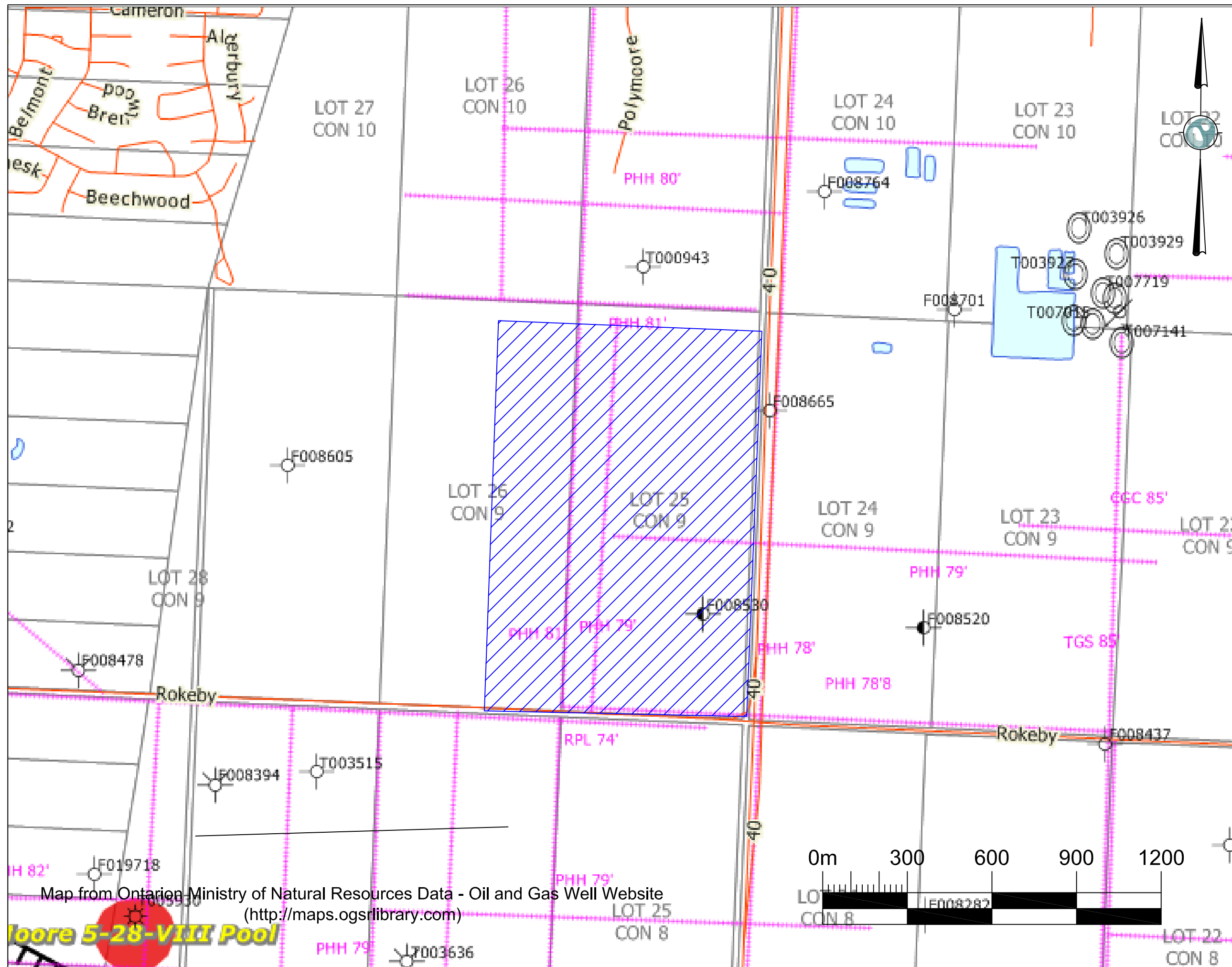
The subject property is located on the St. Joseph's Clay Plain, an area of glaciolacustrine silty clay overburden deposits, more commonly identified as Brookston Clay. These heavy silty clay soils were laid down under glacial period over Devonian limestone bedrock. The overburden thickness is typically 38 m to 43 m with at the proposed development site.

The water table is generally found in the overburden several metres below ground surface and the shape of the water table surface is similar to the ground surface, but underlying it.

A search of the Ontario Oil, Gas & Salt Resources on-line library indicates there are no current or oil or gas wells present on the proposed development site. However, one oil show (exploratory well) advanced and abandoned by Imperial Oil in 1949 was identified within the southeast quadrant of the Solar Farm site. Furthermore, three additional abandoned oil wells were observed to exist within 1 km of the project site's western and northern boundary. Figure 3 shows the locations of the nearest wells to the Solar Farm site.

3.2 Soil and Groundwater Quality

A Phase I Environmental Site Assessment (AMEC, 2008) conforming to the Provincial requirements documented that the site is located in a primarily agricultural area and that the property has been in agricultural use since at least the 1950s and has not had a residential,



LEGEND:

Few Wells in Area
Many Wells in Area

Oil Pool - Active

Oil Pool - Abandoned

Natural Gas Pool - Active

Natural Gas Pool - Suspended

Natural Gas Pool - Abandoned

Natural Gas Storage Pool

Seismic Lines

Fault, Cuts One Geologic Period

Fault, Cuts Precambrian

Fault, Cuts Precambrian - Trenton

Fault, Cuts Trenton

Fault, Cuts Precambrian - Rochester

Gas Show

Gas Show, Abandoned

Gas Show / Oil Show

Gas Show / Oil Show, Abandoned

Oil Well / Gas Show

Oil Well / Gas Show, Abandoned

Gas Well / Oil Show

Source Well

Source Well, Abandoned

Injection Well

Injection Well, Abandoned

Solution Mining Well

Brine Well

Brine Well, Abandoned

Brine Disposal Well

Natural Gas Storage Well

Natural Gas Storage, Abandoned

Cavern Storage Well

Cavern Storage Well, Abandoned

Stratigraphic Test

Stratigraphic Test, Abandoned

Oil Producing Well

Oil Producer, Abandoned

Gas Producing Well

Gas Producer, Abandoned

Oil and Gas Well

Oil and Gas Well, Abandoned

Oil Show

Oil Show, Abandoned

TITLE:

FIGURE 3
HISTORICAL OIL AND GAS -
MOORE SITE

CLIENT:

First Solar.

FIRST SOLAR
DEVELOPMENT CANADA

PROJECT:

PROJECT #: SW04090562
DRAWN BY: MC
DATE: NOVEMBER 2009
SCALE: AS SHOWN

PREPARED BY:

amec

870 Confederation Stre
Sarnia, Ontario
N7T 2E5
Ph: 1-519-337-5409
Fax: 1-519-337-2514

commercial or industrial development registered beyond a typical farm house and barn development.

No investigation of the soil and groundwater quality was undertaken as part of the EIS. However, the only compounds likely to impact the soil or groundwater are residues from pesticides/herbicides which are used at the site as part of the agricultural practice and possibly nitrates from excess application of fertilizers. It is considered unlikely that unacceptable concentrations of either of these can be detected in the groundwater in the bedrock aquifer. The site would be assumed to be of good environmental quality from a soil and groundwater perspective.

In order to confirm this conclusion with more confidence, sampling and analysis of soil and groundwater would be required.

3.3 Surface Water Drainage

A portion of the site is traversed by two open ditch drains, namely, the Lukey and Rumohr Drains. These drains form part of the municipal drainage system maintained by St. Clair Township and the County of Lambton. Drainage from the site flows through the Lukey and Rumohr Drains into Baby Creek and subsequently the St. Clair River. Details of the stormwater management for the development will be presented under separate cover in the Stormwater Management Plan report currently being assessed and completed for the Site.

Generally speaking, surface water drainage is not expected to be drastically modified by the proposed development, as the solar farm will continue to use the historical Site elevations and existing drainage contours under the current development plan.

3.4 Terrestrial Ecosystem Existing Conditions

The following section details the findings of the Forest Inventory completed for the Site and distributed by the SCRC is referenced in Appendix B. Details below will be revised and updated with the completion of an additional Woodlot Assessment, to be completed in the coming months at the property. Furthermore, additional efforts to review wildlife and ecology will be required in the spring during the prominent growth and breeding season.

3.4.1 Methodology

The Site investigation was undertaken in October 2009. The site examination focused on the woodlot in existence along the central portion of the northern extent of the Site. It was not available in the SCRC woodlot assessment document of October 2008 whether the information was collected and prepared using the protocols established by the Ecological Land

Classification (ELC) system for Southern Ontario (Lee et al., 1998); however, during completion of the Woodlot Assessment planned in the coming weeks, such procedures will be followed. Lists of all plant and wildlife species observed were compiled within the October 2008 woodlot inventory. Data recorded included species composition, approximate size, age, health and condition of trees.

The woodlot is a hardwood forest type. There is no current ELC classification available that describes this woodlot. Generally, the woodlot was noted to be in healthy condition; however, a number of trees were observed to be hollow, dead or exhibiting signs of disease. The presence of Dutch Elm Disease, Nectria Canker and Black Knot were noted. During management practices in 2004, the ash population was lowered from 20% to 10% of the woodlot to reduce the impact of the Emerald Ash Borer on the total woodlots viability.

The trees are mature though not notably large in diameter (Table 1). Most of the trees were approximately 10 to 36 cm DBH. Oak trees are the dominant tree species (20%) in the canopy including Bur oak (*Quercus macrocarpa*), White Oak (*Quercus alba*), Shumard Oak (*Quercus Shumardii*) and Red Oak (*Quercus rubra*). Other common trees to the woodlot included Hard Maple (*Acer saccharum*), White and Green Ash (*Fraxinus americana* and *Fraxinus pennsylvanica*, respectively), Basswood (*Tilia americana*) and White Elm (*Ulmus americana*) as the dominant species. The shrub and herbaceous layer was composed of primarily Poison Ivy, Grape, Choke Cherry, Purging Buckthorn, Downy arrow-wood Viburnum, Virginia Creeper, Grey Dogwood, American Prickly-Ash, Witch Hazel, European Highbush Cranberry, Raspberry, Buttonbush and Currant.

3.4.2 Wildlife Communities

Evidence of mammal species encountered during the woodlot inventory included a stick nest in a white oak tree observed to contain a nest similar to that of a red tailed hawk (*Buteo jamaicensis*), common in the area. No additional species were noted in the inventory however, common species know to inhabit woodlots in southwestern Ontario may include White-tailed Deer (*Odocoileus virginianus*) Raccoon (*Procyon lotor*) and Gray Squirrels (*Sciurus carolinensis*). Additional identification and discussion of wildlife and bird species will be included in the planned and upcoming woodlot assessment. Species identification during the assessment will consider the surrounding Site property.

3.4.3 Natural Heritage Features

The Solar Farm site is located in St. Clair Township in an area that is not known to contain any provincially significant natural heritage features. None of the species reported in the NHIC website were noted within the boundaries or within 120 metres of the Solar Farm site boundary

or are protected under the Species at Risk Act, Schedule 3 (SARA, 2009). The nearest natural heritage features listed in the NHIC website are presented in Table 1.

Table 1 NHIC/SARA Listed Species Located Near the Project Site

Category	Common Name	Scientific Name	Provincial Rank	SARA Rank
Fish	American Brook Lamprey	Lampetra appendix	Rare To Uncommon	Not Listed
Vascular Plant	Rigid Sedge	Carex tetanica	Rare To Uncommon	Not Listed
Vascular Plant	Long-bearded Hawkweed	Hieracium longipilum	Extirpated	Not Listed
Vascular Plant	Dense Blazing Star	Liatris spicata	Very Rare (Extirpated)	Threatened
Vascular Plant	White-hair Witchgrass	Dichanthelium villosissimum	Rare To Uncommon	Not Listed
Reptile	Five-lined Skink - Carolinian Population	Eumeces fasciatus pop. 1	Very Rare (Extirpated)	Endangered
Vascular Plant	Handsome Sedge	Carex formosa	Rare To Uncommon / Common	Not Listed
Vascular Plant	Carolina Whitlow-grass	Draba reptans	Vary Rare	Not Listed
Vascular Plant	Wild Flax	Linum medium var. texanum	Extremely Rare (Extirpated)	Not Listed
Vascular Plant	Giant Pinedrops	Pterospora andromedea	Vary Rare	Not Listed
Vascular Plant	Mead's Sedge	Carex meadii	Vary Rare	Not Listed
Vascular Plant	American Columbo	Frasera caroliniensis	Very Rare (Extirpated)	Endangered
Fish	Spotted Sucker	Minytrema melanops	Very Rare	Special Concern

Sources: SCRCA, <http://nhic.mnr.gov.on.ca>; and <http://www.sararegistry.gc.ca> – access 17 December 2009.

It should be noted that all species listed in the table above were located at distances greater than 120 m from the proposed development site as shown on Figure 2. This information was generally confirmed by the MNR on 11 January 2010, stating in an email that no EOs or Species of Concern are known to exist in the Site area. Additionally, all species listed above as endangered other threatened under SARA appear to be Extirpated in this area with the last observed sighting of the species greater than 75 years ago, in all cases.

3.5 Land Use

AMEC reviewed the current land uses of neighbouring properties from publicly accessible locations to assess possible environmental impacts to the Site that may arise from off-site operations. Properties in the general area surrounding the Site are primarily mixed residential, agricultural and industrial in use. Properties surrounding the Site are summarized as follows:

North of the Site

North of the Site was a woodlot and railway shunting and storage area, beyond which, an industrial business park exists.

East of the Site

East of the Site is the Highway 40 right-of-way; beyond which are industrial operations associated with an adjacent NOVA chemicals refinery and agricultural fields.

South of the Site

South of the Site is the Rokeby Line right-of-way, beyond which is the Suncor Ethanol Plant and Nova Moore Plant.

West of the Site

West of the Site is a north/south trending railway corridor, beyond which is agricultural land and residential properties.

4.0 POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION

The natural environment of the site and adjacent areas can be affected by various activities during construction and operation of the site. The potential project/environment interactions have been summarized in Table 4.

Table 2 Potential Project-Environment Interactions

	Environmental Components Key Project Works and Activities	Geology and Hydrogeology Resources	Surface Water Drainage	Local Plant Communities	Local Wildlife Communities and Habitat
1	Construction Phase				
	Site clearing and grading	-	O	O	O
	Operation of storage and laydown areas	-	O	-	-
	Operation of temporary storm water management system	-	O	-	-
	Construction truck traffic	-	-	-	-
	Development of permanent road access	-	O	-	-
	Temporary storage of fuels	O	O	-	-
	Construction labour force	-	-	-	-
2	Operational Phase				
	Operation of utilities	-	-	-	-
	Storm water management	-	+	-	-
	Array maintenance	-	-	-	-
	Labour force and administration	-	-	-	-

O Potential for adverse effect (●) Potential for beneficial effect - No effect expected

4.1 Mitigation Methods and Significance of Residual Impacts

4.1.1 Construction Phase

4.1.1.1 Environmental Management Plan (Construction)

To avoid adverse environmental effects and to minimize unavoidable negative effects, an Environmental Management Plan (EMP) will be prepared by First Solar Development (Canada) Inc., specifically for the construction phase of the project. The EMP will prescribe all environmental management measures, mitigation measures, spill prevention protocols, contingency measures, responsibilities, supervision, and reporting.

The EMP is an essential tool for minimizing adverse environmental effects. Key provisions of the EMP will include but will not necessarily be limited to such topics as:

- Temporary storm water management;

- Erosion Control Plan;
- Storage of fuels and lubricants;
- Material storage;
- Spill prevention;
- Spill containment and clean up protocols and equipment;
- Maintenance of machinery;
- Housekeeping protocols;
- Construction waste management;
- Dust management;
- Encounter of finds of potential archaeological interest;
- Encounter of contaminated soils;
- Site access and construction traffic routing;
- Construction envelop;
- Tree protection;
- Environmental supervision;
- Health and Safety standards and protocols; and
- Reporting.

4.1.2 Operations Phase

4.1.2.1 *Environmental Management Plan (Operation)*

Similar to the Environmental Management Plan (EMP) for the construction phase, an EMP will be developed by First Solar Development (Canada) Inc. for operation of the Solar Farm. The overall objective of the EMP is to ensure the Solar Farm operates in compliance with regulatory standards and permits issued by the Ministry of the Environment.

The EMP will become integral part of the Solar Farm operation manuals and protocols and will be subject to periodic reviews and updating. Solar Farm management and maintenance personnel will be required to be familiar with the provisions of the EMP and will be responsible for its implementation including staff training and reporting.

Key provisions of the EMP will include but will not necessarily be limited to such topics as:

- Responsibilities;
- Environmental Procedures;
 - Storm Water discharges;
 - Traffic management;
 - Chemical management;
 - Shut down policies;
 - Inspections;

- Spill prevention;
- Monitoring;
- Equipment;
 - Preventative maintenance;
- Health and safety;
 - Policies;
 - Standards and protocols;
 - Requirements for contractors and suppliers;
 - Incident reporting;
- Emergency preparedness and response plan;
 - Responsibilities;
 - Spill containment and clean up procedures and equipment;
- Management of Environmental Program;
 - Training;
 - Documentation;
 - Reporting;
 - Continuous Improvement; and
 - Management review.

The EMP will be periodically reviewed and updated.

5.0 CONCLUSIONS

Impacts associated with development of the site are primarily concerned with potential impacts to the Lukey, Rumohr and Nesbit Award Drains, along with potential impacts to the woodlot located along the north of the property. Impact details to the woodlot will be further assessed in the Woodlot Assessment to be conducted in the coming months. .

As part of the solar farm development, First Solar is also considering additional options for the on-going encouragement of the natural communities and visual impacts around the Site. One of these current considerations being looked at include the addition of new woodlot (at and around perimeter of existing woodlot land) as part development plan to encourage plant and wildlife viability and sustainability along the north of the Site and reinforce the already existing natural buffer area which exists on and adjacent to the Site boundary. Details related to additional environmental and aesthetic project initiatives will be further addressed in the separate development plans being prepared for the Site.

The Solar Farm arrays are expected to be positioned such that they will be located outside of the SCRCA Regulated areas (by a minimal margin of 30 metres) and St. Clair Township Municipal Drains (by a minimal margin of 15 metres from open drain or natural watercourse & 5 metres from buried municipal drains) thereby avoiding any encroachment on the Baby Creek Regulated Area and the Lukey, Rumohr and Nesbit Award Drains. That noted, the Site development plan will likely require the relocation/movement of a portion of buried drainage tile (circa 1916) associated with outflow into the Nesbit Award Drain. This mindset has already been raised by St. Clair Township Drainage Superintendent and would be part of finalizing the Site plan with the municipality.

Adverse residual effect to the local Natural Heritage features is not currently anticipated; however, cannot currently be confirmed until follow-up review is completed of information from the upcoming woodlot assessment activities. Although, the proposed environmental mitigation strategies are anticipated to maintain the area's natural heritage system form and function without impeding upon existing habitats or modifying land other than existing agricultural or residential developments. Preliminary review of the Natural Heritage information by the MNR has not identified potential concerns on the Site.

6.0 CLOSURE

This report was prepared for the exclusive use of First Solar Development (Canada) Inc. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. Should additional parties require reliance on this report, written authorization from AMEC will be required. With respect to third parties, AMEC has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up action and costs.

The report is based on data and information collected during the Environmental Impact Study between 12 November and 18 December 2009. Except as otherwise may be specified, AMEC disclaims any obligation to update this report for events taking place, or with respect to information that becomes available to AMEC after the time during which AMEC conducted the investigation.

AMEC makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

This Report is also subject to the further Standard Limitations contained in Technical Services Agreement dated 24 September 2009.

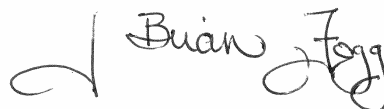
We trust that the information presented in this report meets your current requirements. Should you have any questions, or concerns, please do not hesitate to contact the undersigned.

Yours truly,

AMEC Earth & Environmental
a division of AMEC Americas Limited

A handwritten signature in black ink, appearing to read "Mike Crabb".

Mike Crabb, BES, CET, CCEP
Environmental Scientist

A handwritten signature in black ink, appearing to read "Brian Fogg".

J. Brian Fogg, P.Eng.
Senior Engineer

Appendix A
Site Photographs


APPENDIX B - SITE PHOTOGRAPHS


PROJECT NO. SW04090562

PROJECT Environmental Impact Study

LOCATION Moore Site - St. Clair Township, Ontario

ENCLOSURE 1

	PHOTOGRAPH	1
	Description	
<p>Looking north across the proposed development site towards the adjacent woodlot bordering the northern perimeter.</p>		

	PHOTOGRAPH	2
	Description	
<p>Looking northwest across the western boundary of the Site at the railway and electrical corridor trending along the property boundary.</p>		


APPENDIX B - SITE PHOTOGRAPHS

PROJECT NO. SW04090562

PROJECT Environmental Impact Study

LOCATION Moore Site - St. Clair Township, Ontario

ENCLOSURE 2

	<table border="1"> <tr> <td>PHOTOGRAPH</td> <td>3</td> </tr> </table>	PHOTOGRAPH	3
PHOTOGRAPH	3		
<table border="1"> <tr> <td>Description</td> </tr> <tr> <td>Looking south at a drainage pipe making up a portion of the Lukey drain as it transitions from the north side of Rokeby Line to the south side of the road.</td> </tr> </table>		Description	Looking south at a drainage pipe making up a portion of the Lukey drain as it transitions from the north side of Rokeby Line to the south side of the road.
Description			
Looking south at a drainage pipe making up a portion of the Lukey drain as it transitions from the north side of Rokeby Line to the south side of the road.			

	<table border="1"> <tr> <td>PHOTOGRAPH</td> <td>4</td> </tr> </table>	PHOTOGRAPH	4
PHOTOGRAPH	4		
<table border="1"> <tr> <td>Description</td> </tr> <tr> <td>Looking at a catchbasin along the north side of Rokeby Line and south of the Site property boundary. The catch basin appears to transition field drainage tile into the Lukey Drain.</td> </tr> </table>		Description	Looking at a catchbasin along the north side of Rokeby Line and south of the Site property boundary. The catch basin appears to transition field drainage tile into the Lukey Drain.
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APPENDIX B - SITE PHOTOGRAPHS


PROJECT NO. SW04090562

PROJECT Environmental Impact Study

LOCATION Moore Site - St. Clair Township, Ontario

ENCLOSURE 3

	PHOTOGRAPH	5
	Description	
<p>Looking west from the south side of Rokeby Line at the continuation of the Lukey Drain.</p>		

	PHOTOGRAPH	6
	Description	
<p>Looking northeast across the southeast corner of the Site at service easement trending along the boundary of the property.</p>		

Appendix B
St. Clair Region Conservation Authority – Forest Inventory

Forest Inventory

OptiSolar Farms Canada

St Clair 1

Lot 25 Con 9 Geographical Township of Moore



By

Donald Craig RPF

October 2008



Woodlot Management Notes

By Donald Craig RPF

October 2008

Lot 25, Con 9 – Geographical Township of Moore

Drainage: good to poor

Soils: Caister clay loam

Topography: gently rolling

Management History: There is evidence that this woodlot was tapped for maple syrup production. It was also grazed for a long period. Dow Chemical purchased the land about 1950 but apparently never used it for any industrial purposes. The agricultural land was leased and the woodlot was left untouched. In 2004 the new owner - David Dobson-asked the St Clair Region Conservation Authority to mark the woodlot for a timber sale using good forest management practices. One of the criteria was to reduce the percentage of ash. Although it made up only 20% of the basal area in 2004 it made up 31% of the total stems cut and 26% of the volume.

Species Composition: Bur oak 20%, hard maple 15%, , white oak 10%, white and green ash 10%, basswood 10 %, white elm 10% and other species 20% (American beech, red oak, chinquapin oak, Shumard oak, bitter hickory, cottonwood, shagbark hickory, silver maple, Juneberry, American sweet crabapple, American blue-beech, ironwood Manitoba maple, black walnut, and black cherry)

Shrubs and Vines: Poison ivy, grape, choke cherry, purging buckthorn, downy arrow-wood viburnum, Virginia creeper, choke cherry, grey dogwood, American prickly-ash, witch hazel, European highbush cranberry, raspberry, buttonbush and currant.

Basal Area:

Basal area readings varied from 8-30M²/ha, with an average of 23.3 M²/ha

Size Classes	Pole wood 10-24 cm		Small sawlog (26-36cm)		Medium sawlog 38-48cm		Large sawlog (50-60 cm)		XLarge sawlog 62cm+		Total	
Quality	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
BA by quality class	5.75	1.12	5.75	.88	3.75	.12	3.88	.12	1.88			
Total BA	6.95		6.53		3.87		4.00		1.88		23.3	
# Of Trees Per Ha Represented By Each Unit of Basal Area												
	51.4		13.4		6.6		3.75		3.5			
Average # of Trees Per Diameter Class per Ha												
	295	57	77	69	24	1	14	1	6			

Disease and Insects: Even though there are a lot of hollow trees, dead trees and trees with obvious disease overall the woodlot seems quite healthy.

Nectria (target) canker on white elm, basswood, hard maple and soft maple

Dutch elm disease

Black knot on choke cherry

Wildlife Features: 1 stick nest probably a red tailed hawk in a 70 cm DBH white oak.
Lots of cavities and mast trees, lots of ephemeral pools for amphibians

Comments for Management:

This woodlot was harvested under good forest management practices in 2004. The loggers did very good work and left little residual damage. The percentage of Ash was lowered from 20% to 10%. Of more significance is the fact that 90% of the residual ash are not dominant trees so if they are killed by emerald ash borer they will not have a significant impact upon aesthetics, wildlife nor the rest of the forest canopy. As a result of the canopy gaps created by the thinning there is adequate regeneration of white elm, soft maple, hard maple, green ash and white ash as well as some regeneration of red, white, burr and swamp white oak.

This woodlot makes a significant contribution to wildlife habitat in the area. It probably qualifies as a "Significant" woodlot under the Lambton County Official Plan and The Lambton County tree protection bylaw.

If EAB kills all the ash trees it will still be a viable woodlot.

There are a few buckthorn and honeysuckle which could be removed

In summary this is a healthy woodlot which will continue into the foreseeable future.

Reference Books

Trees in Canada by John Laird Farrar

Publishers: Fitzhenry and Whiteside

Trees of Ontario by Linda Kershaw

Publishers - Lone Pine

Trees of the Carolinian Forest by Gerry Waldron

The Boston Mills Press

Shrubs of Ontario

James H Soper and Margaret L Heimburger

The Royal Ontario Museum

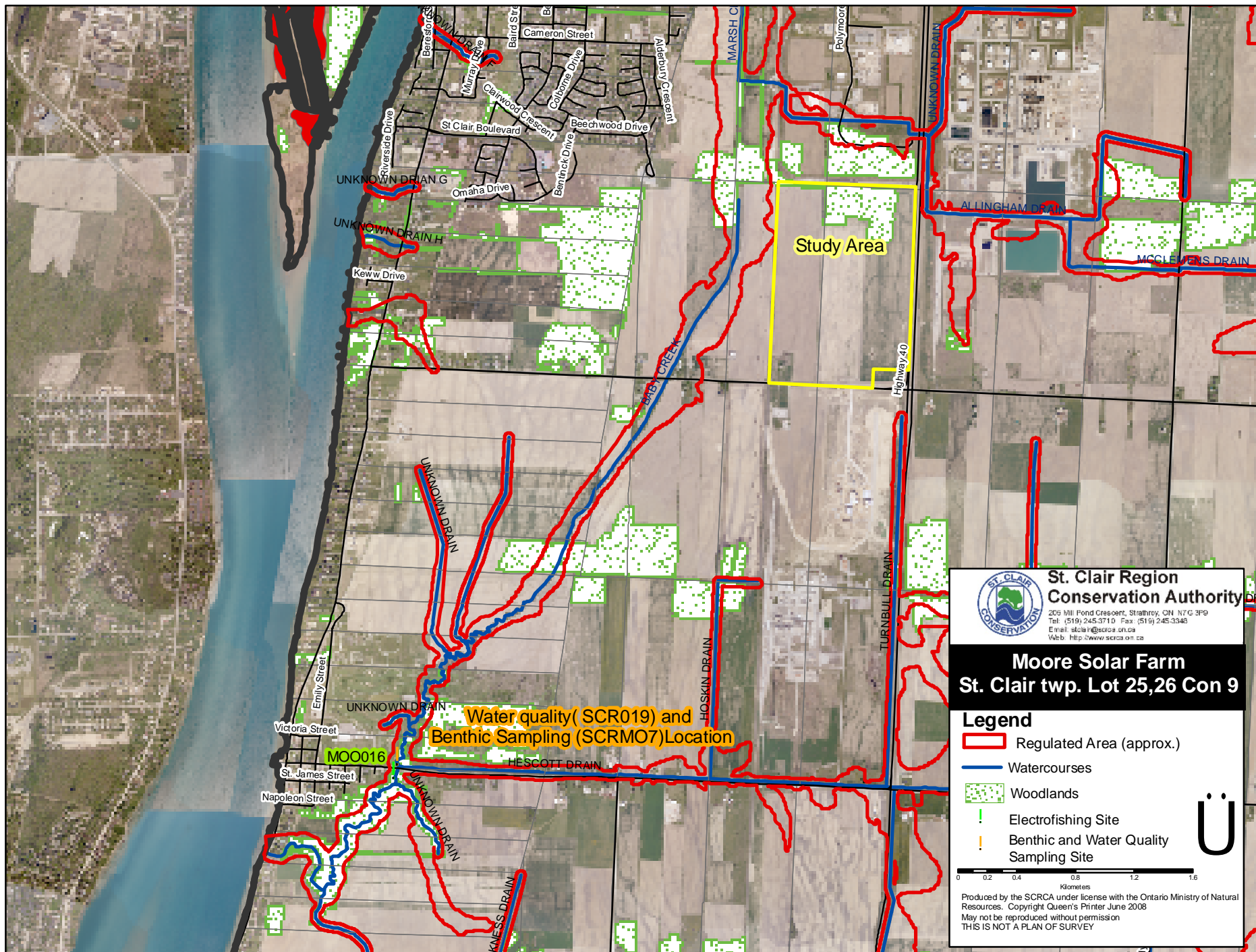
A Silvicultural Guide to Southern Ontario Forests

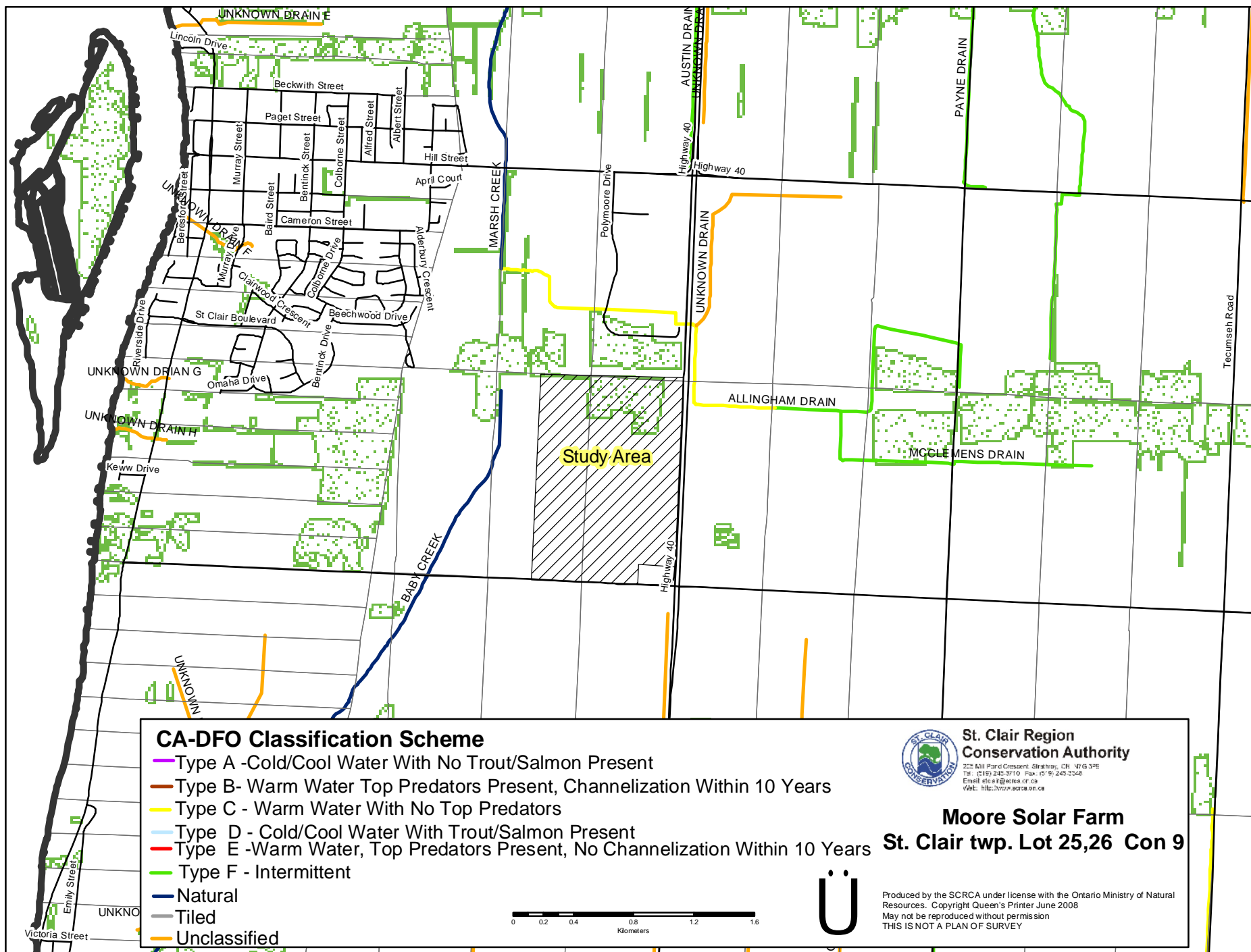
Natural Resources Information Centre
300 Water St
PO box 7000 Peterborough, On
K9J 8M5



Ephemeral pool with buttonbush

Appendix C
St. Clair Region Conservation Authority – Drainage Classification Maps





CA-DFO Classification Scheme

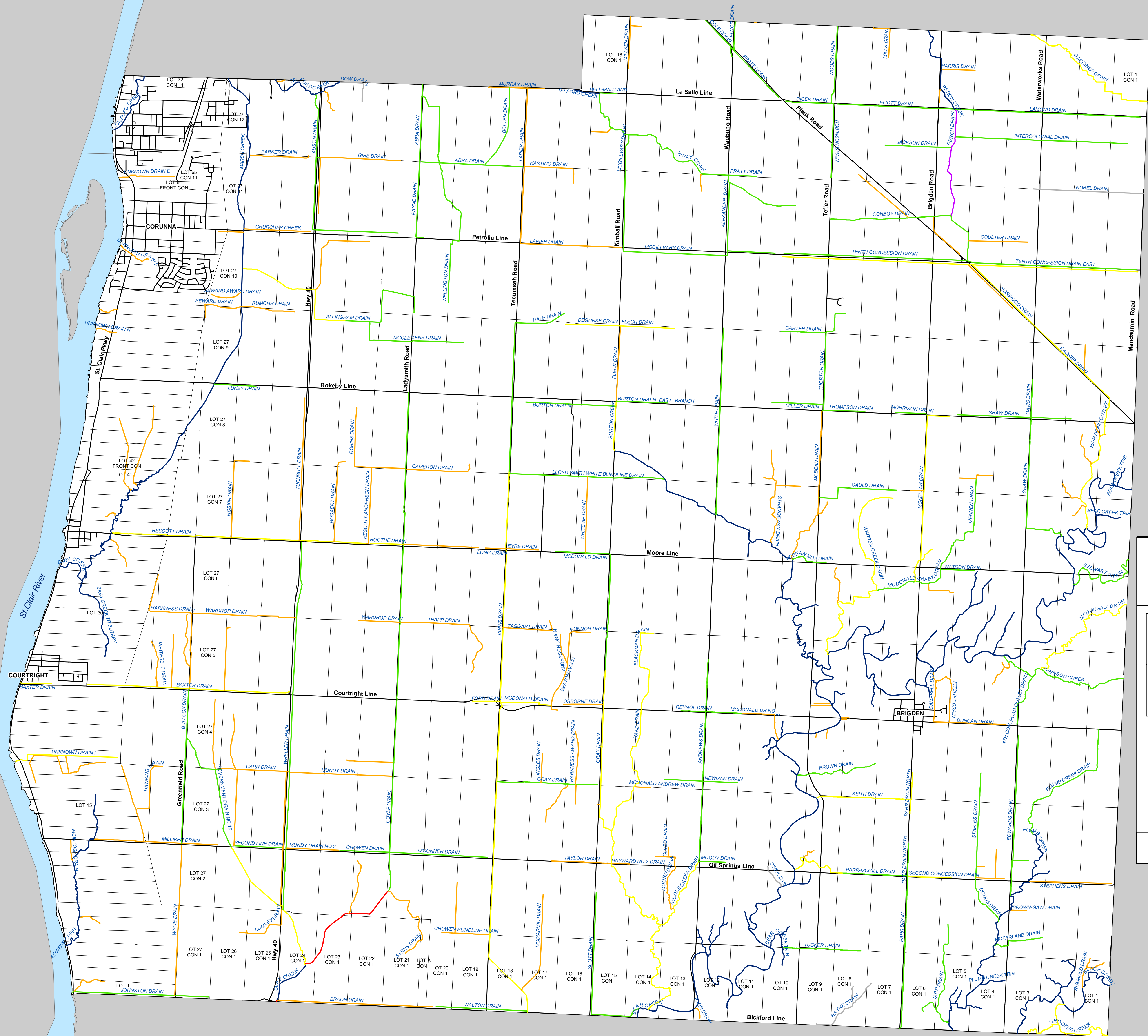
- Type A - Cold/Cool Water With No Trout/Salmon Present
- Type B- Warm Water Top Predators Present, Channelization Within 10 Years
- Type C - Warm Water With No Top Predators
- Type D - Cold/Cool Water With Trout/Salmon Present
- Type E - Warm Water, Top Predators Present, No Channelization Within 10 Years
- Type F - Intermittent
- Natural
- Tiled
- Unclassified

St. Clair Region Conservation Authority
221 Mill Pond Crescent, Strathroy, ON N7G 3P6
 Tel: (519) 245-3110 Fax: (519) 245-3348
 Email: info@scra.on.ca
 Web: <http://www.scra.on.ca>

Moore Solar Farm
St. Clair twp. Lot 25,26 Con 9

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 THIS IS NOT A PLAN OF SURVEY

Township of St. Clair
Geographic Township of Moore
Municipal Drain Classification Map

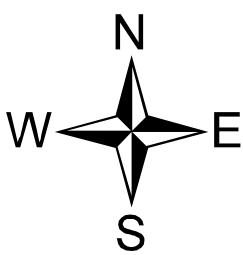


**St. Clair Region
Conservation Authority**

205 Mill Pond Crescent, Strathroy, ON, N7G 3P9
Tel: (519) 245-3710 Fax: (519) 245-3348
Email: stclair@scra.on.ca
Web: <http://www.scra.on.ca>

CA-DFO Classification Scheme

- Type A - Cold/Cool Water With No Trout/Salmon Present
- Type B - Warm Water Top Predators Present, Channelization Within 10 Years
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- Type F - Intermittent
- Natural
- Tiled
- Unclassified



0 0.5 1 2 Kilometers
1:30,000

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Funding assistance provided by Fisheries and Oceans Canada

Drain Classification Maps

The Drain Classification maps (2004 edition) were created from the digital flow layer that was received from the Ontario Ministry of Natural Resources in accordance with their data sharing agreement. The drainage flow layer was the result of updating 1983 Ontario Base Mapping using National Topographic Survey (NTS) data and hard copy 1992 aerial photography. This task was completed in early 2000.

As the Drain Classification Review process continued, further data sources were used to update the flow layer in 2003. These data sources were wide ranging and included: verbal input and hand drawn maps from drainage superintendents, fisheries data collection and historical OMAFRA drainage maps. These updates were added to create a flow layer that reflected the information received from each drainage Superintendent in 2003. These additions are an approximation based on the accuracy of the data provided.

It should be noted that not all drains are found on the maps, with specific reference to closed/tiled systems.