

**PROPOSED ST. CLAIR SOMBRA  
PHOTOVOLTAIC 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:**  
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**February 2010**

**SW04090572**

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## **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 Sombra 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 1 and 2 Concession 11 and Part Lot 1, Concession 10, St. Clair Township in the County of Lambton. The site area is approximately 140 hectares (ha) (of which 59 ha would be utilized for solar arrays and associated structures) 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.

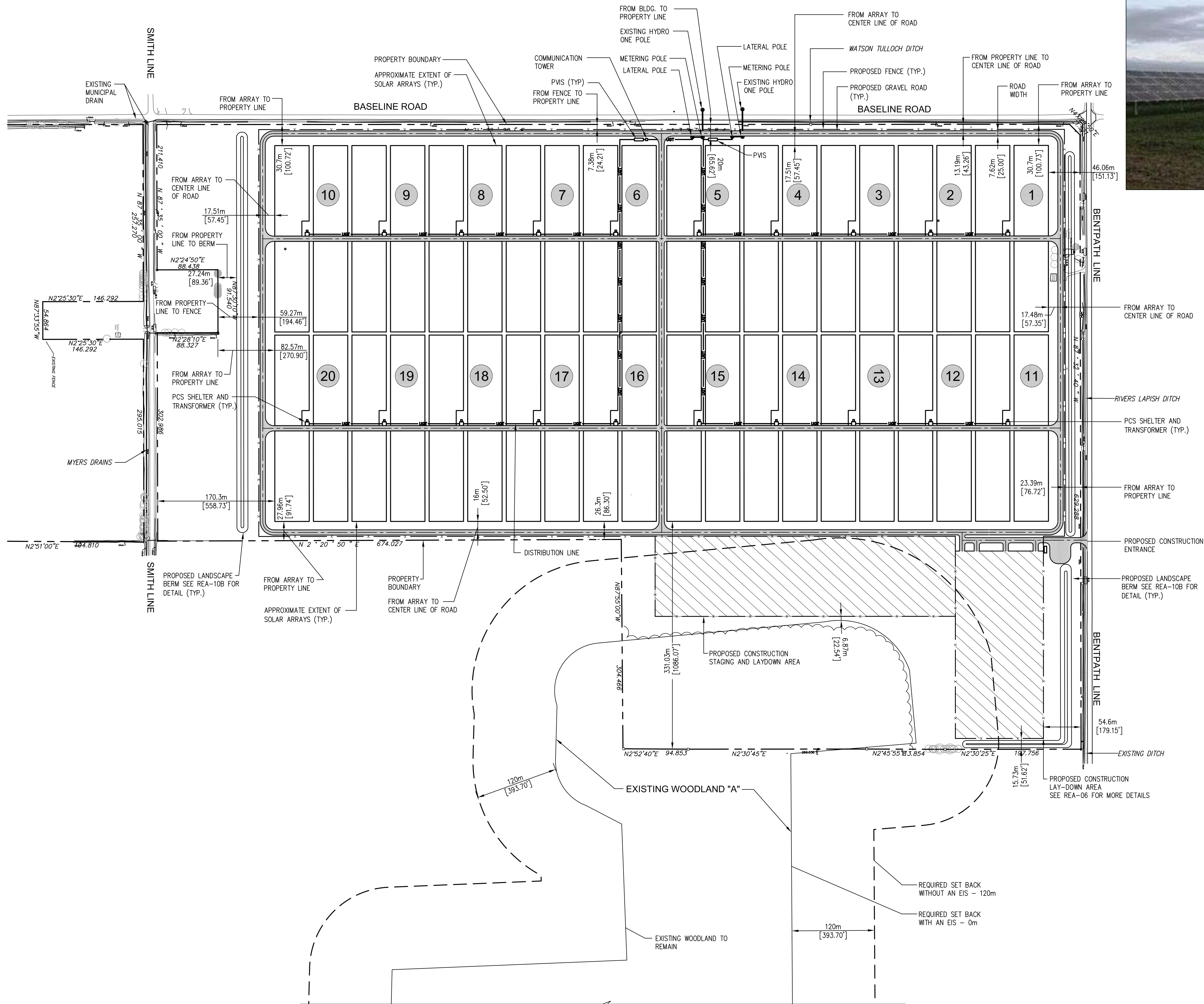
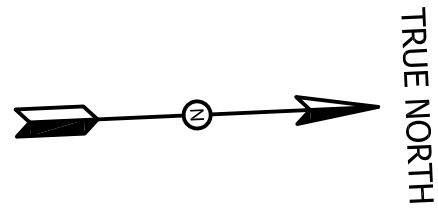
It should also be noted that this EIS does not address the archaeological or cultural heritage resources in the area of the development. The archaeological and heritage assessments are presented in separate documents prepared by others on behalf of First Solar.

### **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 1 and 2 Concession 11 and Part Lot 1, Concession 10, St. Clair Township and encompasses an area of approximately 140 ha, which is currently in agricultural use. Photographs of the proposed development site are presented in Appendix A. The Project requires approximately 59 ha for array construction with associated structures and the remaining area will be undeveloped with portions utilized for a short period during construction. The site lies in an area of mixed residential and agricultural land use within St. Clair Township. Figure 1 presents the project site location and preliminary facility layout.

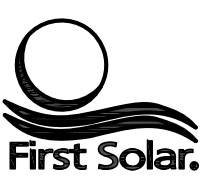




ARRAY PERSPECTIVE

- LEGEND:
- PROPERTY BOUNDARY
  - EXISTING BUILDING
  - ▤ ARRAY
  - UNDER GROUND ELECTRICAL WIRING
  - x- PROPOSED FENCE
  - PROPOSED UTILITY POLE

E	04-28-2010	RE-ISSUED FOR REA PERMIT	DHD	MP	TZ
D	04-06-2010	RE-ISSUED FOR REA PERMIT	FWD	MP	TZ
C	03-01-2010	RE-ISSUED FOR LAYOUT CHANGE	FWD	MP	TZ
B	12-14-2009	ISSUED FOR REA PERMIT	RAR	MP	TZ
A	12-10-2009	ISSUED FOR APPROVAL	DA	MP	TZ
REV	DATE	REVISION DESCRIPTION	BY	CHK	APP



FIRST SOLAR DEVELOPMENT  
(CANADA), INC.  
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SARNIA, ONTARIO, N7T 7H3

ST. CLAIR - SOMBRA  
TOWNSHIP OF ST. CLAIR  
LAMBTON COUNTY, ONTARIO

PROJECT: ST. CLAIR - SOMBRA SOLAR FARM

TITLE: SITE IMPROVEMENT PLAN

PROJ. MGR. KEITH SYMMERS	PROJ. ENGR. TOM ZACCARRA	DR. BY FWD	CHK. BY MP	SCALE: AS SHOWN	REV.
PROJ. DIRECTOR MARK LANGDON	DRAWING NO. 5028-0102-22	REA-05			E

THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

SITE IMPROVEMENT PLAN

SCALE: 1m = 3000m



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The site is bound by agricultural land and intermittent residential developments in all directions. A natural gas terminal facility was observed to the west of the Site and located on the northwest corner of Smith Line and Baseline Road intersection. The property is located approximately 600 m east of the Village of Sombra. The Project's access drive will enter off Smith Line.

There are two residential dwellings with associated structures (i.e. barns) located within the Site boundaries. One property is located at the north extent of the development Site and south of Bentpath Line. The other location is along the southern portion of the Site and adjacent to the north of Smith Line (Figure 1). These structures are 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

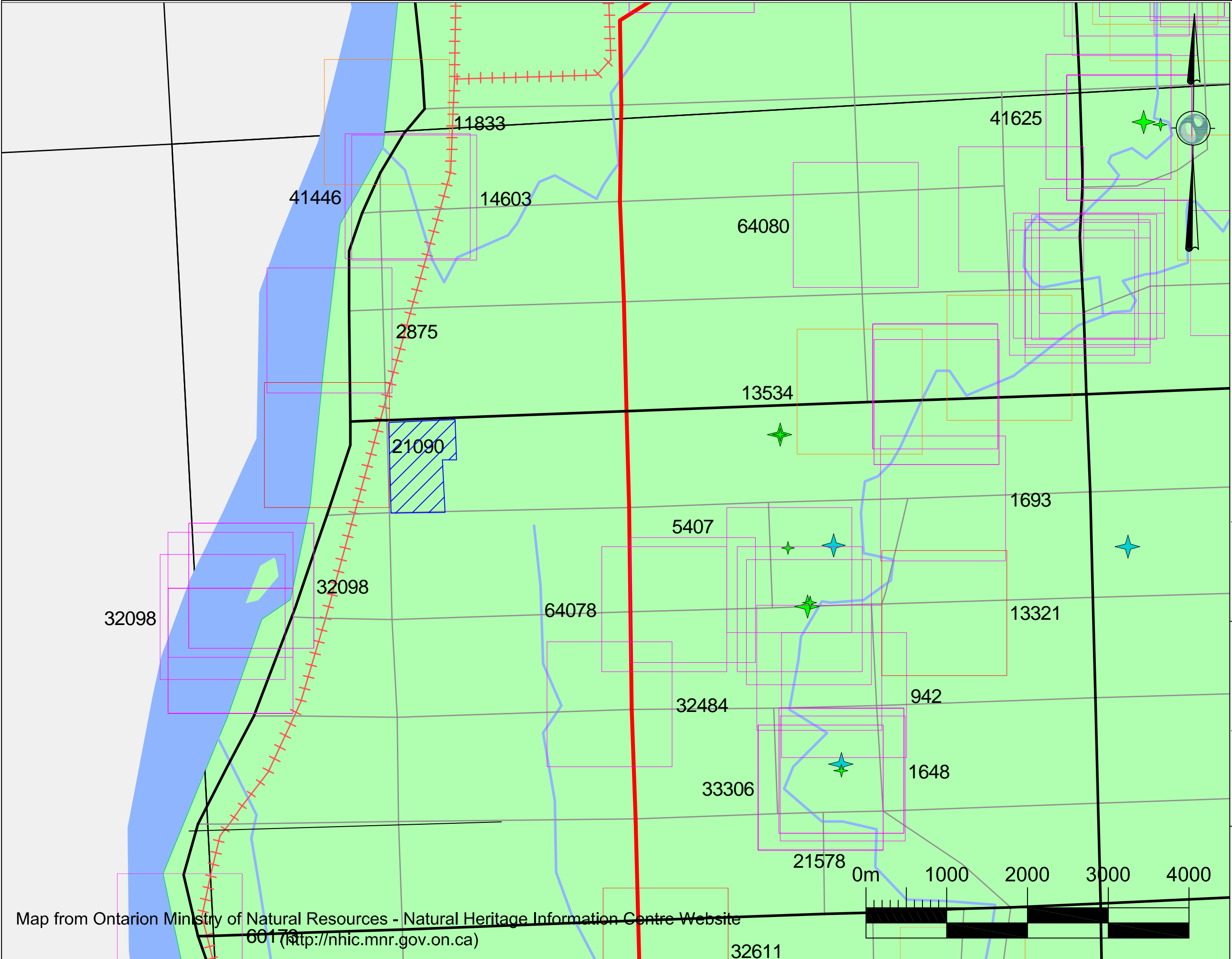
It should be noted that although a number of the above agencies were contacted to obtain information related to natural features, or areas of natural or scientific interest, most deferred to the Ontario Ministry of Natural Resources as being the primary authority for this information.

Although the records review did not identify any natural features, areas of natural or scientific interest 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:

- Three ANSI woodlot areas (Duthill Woodlot, Duthill Woodlot #1 and Duthill Woodlot #3) were identified as being present to east of the Site, respectively at a distances greater than 4 kilometres (km);
- One Non-Provincial wetland (Charlie Grant's Wetland) was identified as being present to the east of the Site, respectively at a distance greater than 4 km; and,
- Several rare or endangered wildlife and plant species were identified (NHIC website and database) at distance greater than 120m from the proposed development site.

In addition to the above information, one rare and endangered bird species (the closest identified species on the NHIC website), namely the Northern Bobwhite (*Colinus virginianus*) was identified as being present (last observed in 1991) in an area adjacent to the west boundary (off-Site) of the proposed development site. This observed and historical siting of the Northern Bobwhite was confirmed as being off-Site by the MNR. Figure 2 presents the current NHIC information available on the MNR and their website posted data.





**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 SOMBRA SITE**

**CLIENT:**

**FIRST SOLAR**  
**DEVELOPMENT CANADA**

**PROJECT:**

PROJECT #: SW04090572  
DRAWN BY: MC  
DATE: JANUARY 2010  
SCALE: AS SHOWN

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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 seven additional species in the general area (within several hundred metres) of the Solar Farm site. After reviewing the table and location blocks, it appears that all noted additional species (with the exception of one or two) provided by the SCRCA would fall outside of 120 m from the proposed development site. A response by the MNR on 11 January 2010 identified only one of those two species (namely the Northern Bobwhite) within 120 m and historically adjacent to the Site.

### **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 northeast corner of the Site. The woodlot can be observed in Figure 1 and is approximately 36 ha in size, meeting 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. It should be noted that the woodlot does not exist within 120m of the proposed solar development panels.

At this time a detailed woodlot assessment has not been completed on either woodlot and information was not available as part of the SCRCA information search request for the Site. As such, the completion of a woodlot assessment study will be planned for the Site in the coming months (likely during the Spring). 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.

During the Site investigation walkover on 27 September 2009 and again on 7 December 2009, no wildlife was observed during the walkover period on-Site. The only wildlife observed included several wild turkeys (*Meleagris gallopavo*) walking westerly along the tree line at the north extent of the McKeough Diversion Channel and southwest of the Site boundary. In addition, open municipal drains observed trending the perimeter of the Site were noted to be dry and not water containing.

### **2.1.3 Determination of Significance**

Based upon the results of the records search and the site investigation, the woodlot located on the undeveloped portion of the Site, 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 indicating that there were no Element Occurrences ("EO") or known Species at Risk at, or near, the development Site beyond the previously identified Northern Bobwhite (*Colinus virginianus*) adjacent to the west of the Site and last observed in 1991. The MNR did not suggest any required course of action related to the Northern Bobwhite in the response.

## **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 fall within a flood regulated concern zone; however, based on a subsequent review of records and detailed within a 26 June 2009 letter, the regulated flood area does not apply to the Site. 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 that border the vicinity of the project site.

The Rivers Lapish (open ditch), Watson Tulloch (open ditch) and Myers Drains (open ditch) are located adjacent/along the Site's northern, western and southern property extents, respectively.



These three drains are inferred to transfer water from the site and surrounding properties into the St. Clair River located approximately 1 km west of the Site. In addition, along the west side of the Site, the Watson Tulloch transfers the north half of its drainage into the Rivers Lapish Drain and the southern half into the Myers Drain. Furthermore, the McKeough Diversion Channel can be observed within approximately 750 m of the southern property boundary. The McKeough Diversion Channel is a drain utilized during times of flooding. All drains discussed above and surrounding the Site have been noted to be classified as Intermittent drains by the SCRCA.

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 carries the majority of Site infiltration runoff water into both the Rivers Lapish and Myers Drains. During the site investigation, a catchbasin assembly with drainage tile inlets was observed at the northwest corner of the property. Follow-up discussions with the St. Clair Township Drainage Superintendent noted that subgrade field drainage entering that catch basin was responsible from draining the north half of Lot 1, Concession 11.

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 56 m to 60 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 active oil or gas wells present on the proposed development site. However, the following three historical well locations were identified at the Site:

- T002770 – was an advanced and abandoned dry hole completed and sealed in 1969 by J. Harmon to a depth of 719 m;
- T002950 – was an advanced and abandoned dry hole completed and sealed in 1970 by J. Harmon to a depth of 724 m; and,

- T009349 – was an advanced and abandoned dry hole completed and sealed in 2000 by Manti Operating to a depth of 750 m.

Furthermore, several additional abandoned wells including active natural gas storage pools were observed to exist within 1 km of the project site's boundaries. 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 1960s and has not had a residential, 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.

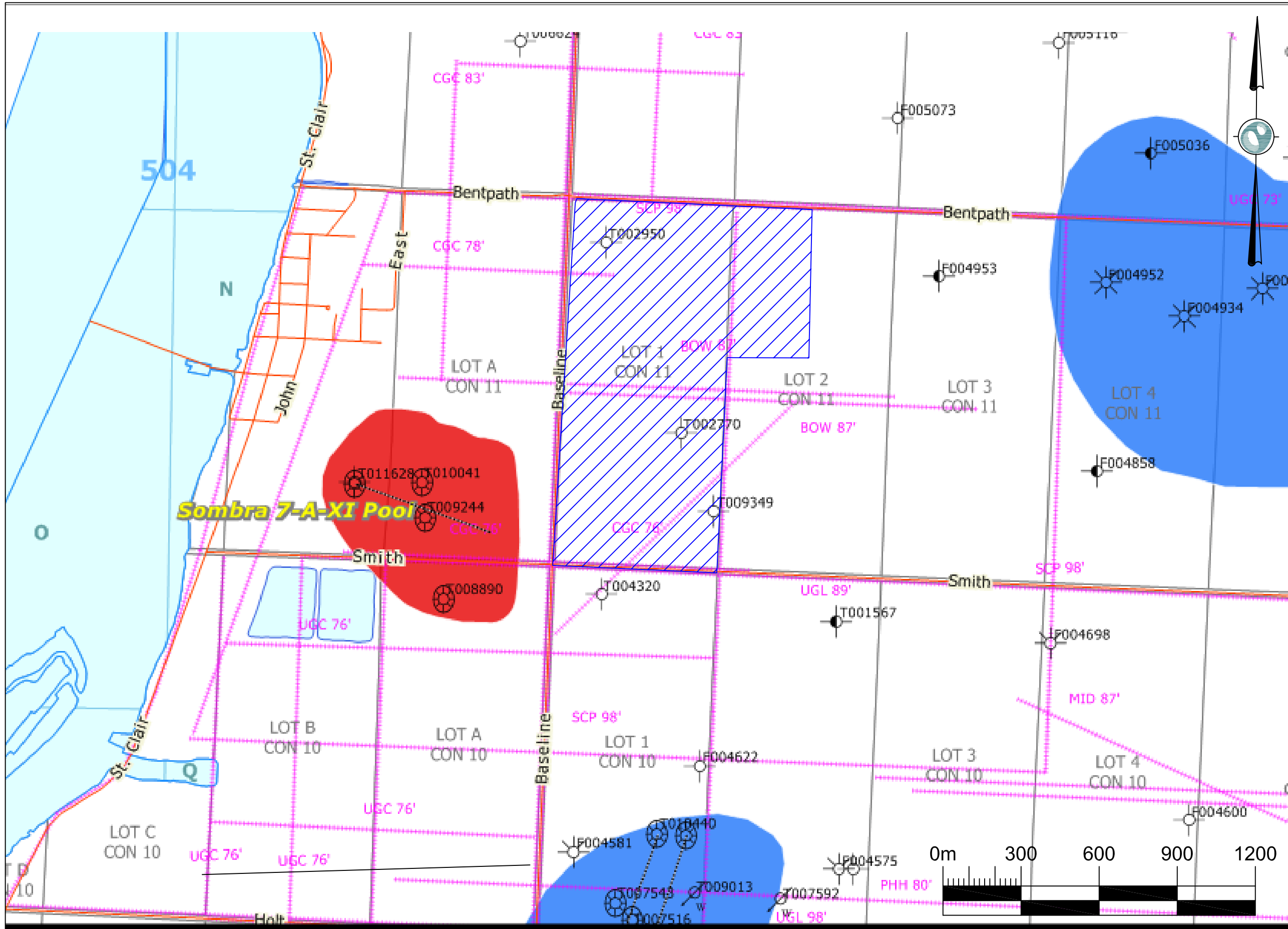
In order to confirm this conclusion with more confidence, sampling and analysis of soil and groundwater would be required.

### **3.3 Surface Water Drainage**


A portion of the site is traversed by three open ditch drains, namely, the Rivers Lapish, Watson Tulloch and Myers 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 from the Watson Tulloch Drain into both the Rivers Lapish and Myers Drains eventually conveying water into 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.

















































### **3.4 Terrestrial Ecosystem Existing Conditions**

The following sections will expanded upon and detail the findings of a woodlot assessment, to be completed in the coming months at the property. When completed, the woodlot assessment



**LEGEND:**

 **Approximate Site Area**

	Few Wells in Area		Gas Show
	Many Wells in Area		Gas Show, Abandoned
	Oil Pool - Active		Gas Show / Oil Show
	Oil Pool - Abandoned		Gas Show / Oil Show, Abandoned
	Natural Gas Pool - Active		Oil Well / Gas Show
	Natural Gas Pool - Suspended		Oil Well / Gas Show, Abandoned
	Natural Gas Pool - Abandoned		Gas Well / Oil Show
	Natural Gas Storage Pool		Source Well
	Seismic Lines		Source Well, Abandoned
	Fault, Cuts One Geologic Period		Injection Well
	Fault, Cuts Precambrian		Injection Well, Abandoned
	Fault, Cuts Precambrian - Trenton		Solution Mining Well
	Fault, Cuts Trenton		Brine Well
	Fault, Cuts Precambrian - Rochester		Brine Well, Abandoned
	Licenced Well, Undrilled		Brine Disposal Well
	Well Location, Unknown Type		Natural Gas Storage Well
	Observation Well		Natural Gas Storage, Abandoned
	Dry Hole, Potential or Suspended		Cavern Storage Well
	Dry Hole, Abandoned		Cavern Storage Well, Abandoned
	Oil Producing Well		Stratigraphic Test
	Oil Producer, Abandoned		Stratigraphic Test, Abandoned
	Gas Producing Well		Oil Show
	Gas Producer, Abandoned		Oil Show, Abandoned
	Oil and Gas Well		
	Oil and Gas Well, Abandoned		
	Oil Show		
	Oil Show, Abandoned		

**TITLE:**

**FIGURE 3**  
**HISTORICAL OIL AND GAS -**  
**SOMBRA SITE**

**CLIENT:**

**FIRST SOLAR**  
**DEVELOPMENT CANADA**

**PROJECT:**

PROJECT #: SW04090572  
DRAWN BY: MC  
DATE: NOVEMBER 2009  
SCALE: AS SHOWN

**PREPARED BY:**

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will help to provide a greater level of information detailing the composition of the woodlot at the Site, in addition to reviewing the existing of wildlife at the Site. 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**

Site investigation was undertaken on 27 September 2009 by AMEC personnel with a follow-up Site reconnaissance conducted on 7 December 2009. The site examination focused on the Site layout and the general conditions of the woodlot located at the Site. Currently, a woodlot assessment has not been completed for the Site; however, is intended in the coming months. When completed the woodlot assessment will be conducted and prepared using the protocols established by the Ecological Land Classification (ELC) system for Southern Ontario (Lee et al., 1998).

### **3.4.2 Wildlife Communities**

During the Site investigation in October 2009, wildlife species were not noted on-Site during the reconnaissance activities. 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.

In addition, to the general review of species and terrestrial components that make up the assessment activities, specific efforts will be made to identify indicators of the existence of the Northern Bobwhite bird species should it still exist in the general area of the Site.

### **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 (ANSI denoted areas). None of the species reported in the NHIC website (2007) were noted within the boundaries or within 120 metres of the Solar Farm site boundary within the exception of one species, namely the Northern Bobwhite (*Colinus virginianus*) which is protected under the Species at Risk Act, Schedule 1 (SARA, 2009). The Northern Bobwhite was identified as being present (last observed in 1991) in an area adjacent to the west boundary (off-Site) of the proposed development site. The nearest natural heritage species listed in the NHIC website are presented in Table 1.

Confirmation of species reported for the Project site under the Species at Risk Act, Schedule 1 (SARA, 2009) was obtained from MNR on 11 January 2010 based on data available through the NHIC system and MNR Biologists. The NHIC website lists the species in Table 1 as being

located within the vicinity (1 km) of the study area, and are protected under the Species at Risk Act, Schedule 1. Table 1 also includes NHIC species data updates for 2008 provided by the SCRCA. Based on the response received by the MNR on 11 January 2010, it appears that no EOs or Species of Concern are known to exist at the Site or within 120m of the Site albeit the Northern Bobwhite (*Colinus virginianus*) species reported adjacent to the Site in 1991.

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

Category	Common Name	Scientific Name	Provincial Rank	SARA Rank
Vascular Plant	White-hair Witchgrass	<i>Dichanthelium villosissimum</i>	Rare to Uncommon	Not Listed
Bird	Barn Owl	<i>Tyto alba</i>	Extremely Rare (Endangered)	Endangered
Bird	Northern Bobwhite	<i>Colinus virginianus</i>	Extremely to Very Rare (Endangered)	Endangered
Vascular Plant	American Lotus	<i>Nelumbo lutea</i>	Very Rare	Not Listed
Vascular Plant	Spreading Chervil	<i>Chaerophyllum procumbens</i>	Very Rare	Not Listed
Fish	Spotted Sucker	<i>Minytrema melanops</i>	Very Rare (Special Concern)	Special Concern
Vascular Plant	Rigid Sedge	<i>Carex tetanica</i>	Rare to Uncommon	Not Listed
Vascular Plant	Swamp Rose-mallow	<i>Hibiscus moscheutos</i>	Rare to Uncommon (Special Concern)	Special Concern
Vascular Plant	Emory's Sedge	<i>Carex emoryi</i>	Rare to Uncommon	Not Listed

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

It should be noted that with the exception of the bird species identified, all other note plant and fish species are attributed to wetland or areas of frequent moisture. As such, there is a possibility of reduced likelihood that any of these species would be common to the intermittent ditches border the project Site. Additionally, both bird species listed above as endangered under SARA, namely the Northern Bobwhite and Barn Owl appear to have been last observed in 1991 and 1963, respectively, making it unknown whether any currently inhabit areas surrounding the Site. Furthermore, the MNR data review did not identify the Barn Owl as being a potential Species of Concern at, or adjacent to, the Site.

### 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, and agricultural in use. Properties surrounding the Site are summarized as follows:

#### North of the Site

North of the Site is the Bentpath Line right-of-way beyond which agricultural and scattered residential properties can be observed.

#### East of the Site

East of the Site are woodlots, agricultural and scattered residential properties.

#### South of the Site

South of the Site is the Smith Line right-of-way beyond which agricultural lands, woodlots, scattered residential properties and the McKeough Diversion Channel can be observed.

#### West of the Site

West of the Site is the Baseline Road right-of-way, a Union Gas natural gas terminal, agricultural fields, woodlots and scattered 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 2.

**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
<b>1</b>	<b>Construction Phase</b>				
	Site clearing and grading	-	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	-	-	-	-
<b>2</b>	<b>Operational Phase</b>				
	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 Rivers Lapish, Watson Tulloch and Myers Drains, along with potential impacts to the woodlot located along the northeast corner of the Site.

Impact details to the woodlot will be further assessed in the Woodlot Assessment to be conducted in the coming months and are currently anticipated to be minor as the woodlot perimeters will be 120 m or greater from solar development areas. Minor areas for construction laydown are anticipated to occur within 120 m however, are not anticipated to include lands not already utilized for agricultural. Any and all temporary construction utilized land will be restored to a more natural vegetative state including regional appropriate natural grasses to preserve the buffer area. Restoration plans will be included within the EMP planning component of the project.

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 the top of bank on open drains or natural watercourse & 5 metres from buried municipal drains) thereby avoiding any encroachment on the SCRCA Regulated Area and the Rivers Lapish, Watson Tulloch and Myers Drains.

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.

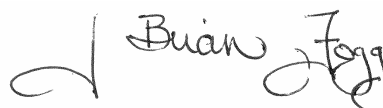
We trust that the information presented in this report meets your current requirements. Should you have any questions, or concerns, please do not hesitate to contact the undersigned.

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 "J. Brian Fogg".

J. Brian Fogg, P.Eng.  
Senior Engineer

Appendix A  
Site Photographs


## APPENDIX A - SITE PHOTOGRAPHS


**PROJECT NO.** SW04090572

**PROJECT** Environmental Impact Study

**LOCATION** Sombra Site - St. Clair Township, Ontario

**ENCLOSURE** 1

	<b>PHOTOGRAPH</b>	<b>1</b>
	<b>Description</b>	
<p>Looking north across the proposed development site towards the adjacent woodlot bordering the northeast corner.</p>		

	<b>PHOTOGRAPH</b>	<b>2</b>
	<b>Description</b>	
<p>Looking west along Smith Line towards the intersection with Baseline Road and the off-site natural gas terminal. The corner of the north portion of the Site can be observed on the right side of the photograph.</p>		


## APPENDIX A - SITE PHOTOGRAPHS


**PROJECT NO.** SW04090572

**PROJECT** Environmental Impact Study

**LOCATION** Sombra Site - St. Clair Township, Ontario

**ENCLOSURE** 2

	<b>PHOTOGRAPH</b>	<b>3</b>
	<b>Description</b>	
<p>Looking north across the southern portion of the development Site from Baseline Road. The southern portion of the Watson Tulloch drain can be observed along the east side of the road.</p>		

	<b>PHOTOGRAPH</b>	<b>4</b>
	<b>Description</b>	
<p>Looking east from the Baseline Road bridge over the McKeough Diversion Channel south of the Site.</p>		




## APPENDIX A - SITE PHOTOGRAPHS


**PROJECT NO.** SW04090572

**PROJECT** Environmental Impact Study

**LOCATION** Sombra Site - St. Clair Township, Ontario

**ENCLOSURE** 3

	<table border="1"> <tr> <td><b>PHOTOGRAPH</b></td> <td><b>5</b></td> </tr> </table>	<b>PHOTOGRAPH</b>	<b>5</b>
<b>PHOTOGRAPH</b>	<b>5</b>		
<table border="1"> <tr> <td><b>Description</b></td> </tr> <tr> <td> <p>Looking east at the Myers drain along the south side of Smith Line. The residential property and agricultural land observed in the photograph make up a portion of the southern development lands.</p> </td> </tr> </table>		<b>Description</b>	<p>Looking east at the Myers drain along the south side of Smith Line. The residential property and agricultural land observed in the photograph make up a portion of the southern development lands.</p>
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<table border="1"> <tr> <td><b>Description</b></td> </tr> <tr> <td> <p>Looking west along the Rivers Lapish Drain at the north extent of Bentpath Line and north of the Site. View includes the open ditch drain trending under Baseline Road and the connection originating from under Bentpath Line from the Watson Tulloch drain adjacent to the Site.</p> </td> </tr> </table>		<b>Description</b>	<p>Looking west along the Rivers Lapish Drain at the north extent of Bentpath Line and north of the Site. View includes the open ditch drain trending under Baseline Road and the connection originating from under Bentpath Line from the Watson Tulloch drain adjacent to the Site.</p>
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<p>Looking west along the Rivers Lapish Drain at the north extent of Bentpath Line and north of the Site. View includes the open ditch drain trending under Baseline Road and the connection originating from under Bentpath Line from the Watson Tulloch drain adjacent to the Site.</p>			


## APPENDIX A - SITE PHOTOGRAPHS


**PROJECT NO.** SW04090572

**PROJECT** Environmental Impact Study

**LOCATION** Sombra Site - St. Clair Township, Ontario

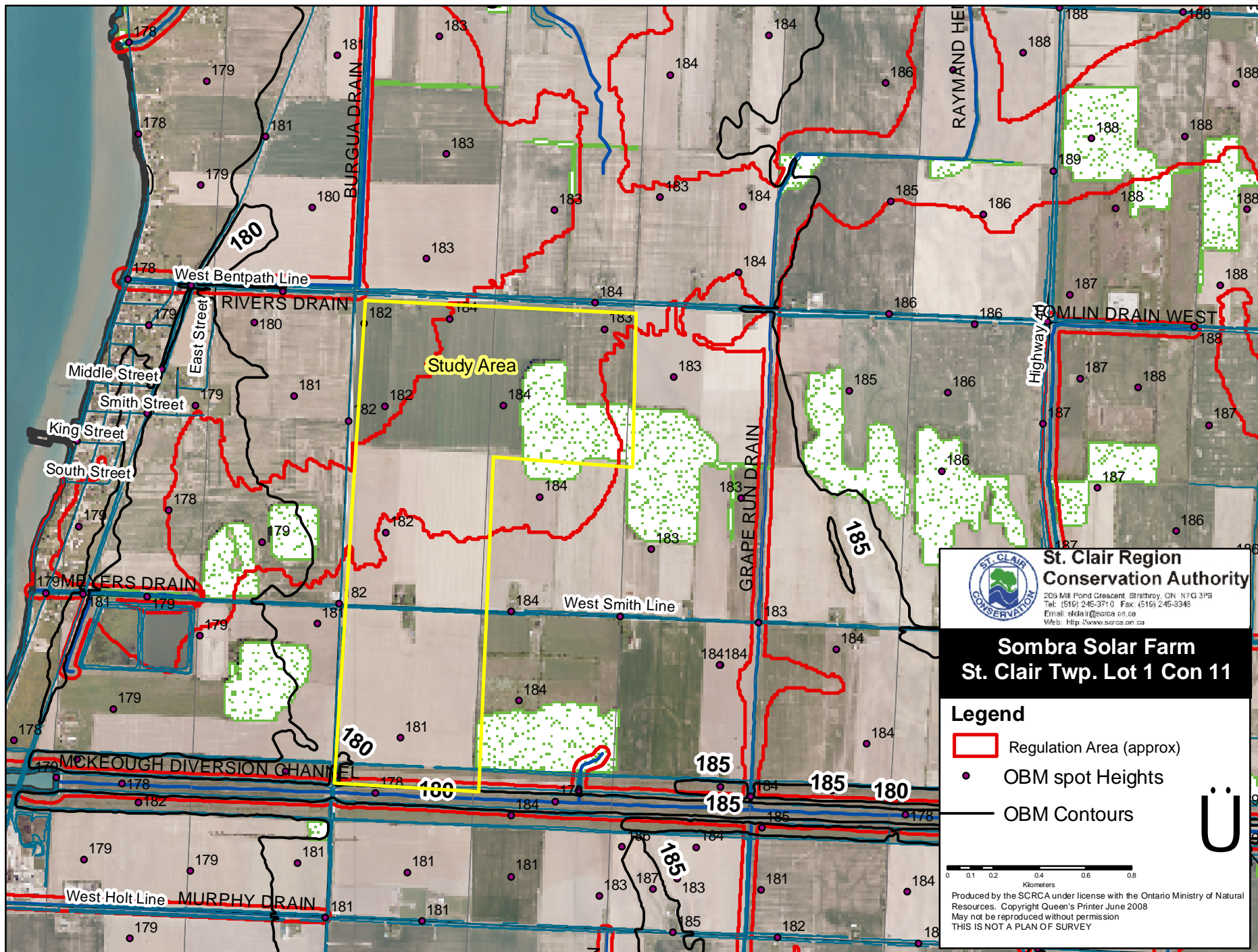
**ENCLOSURE** 4

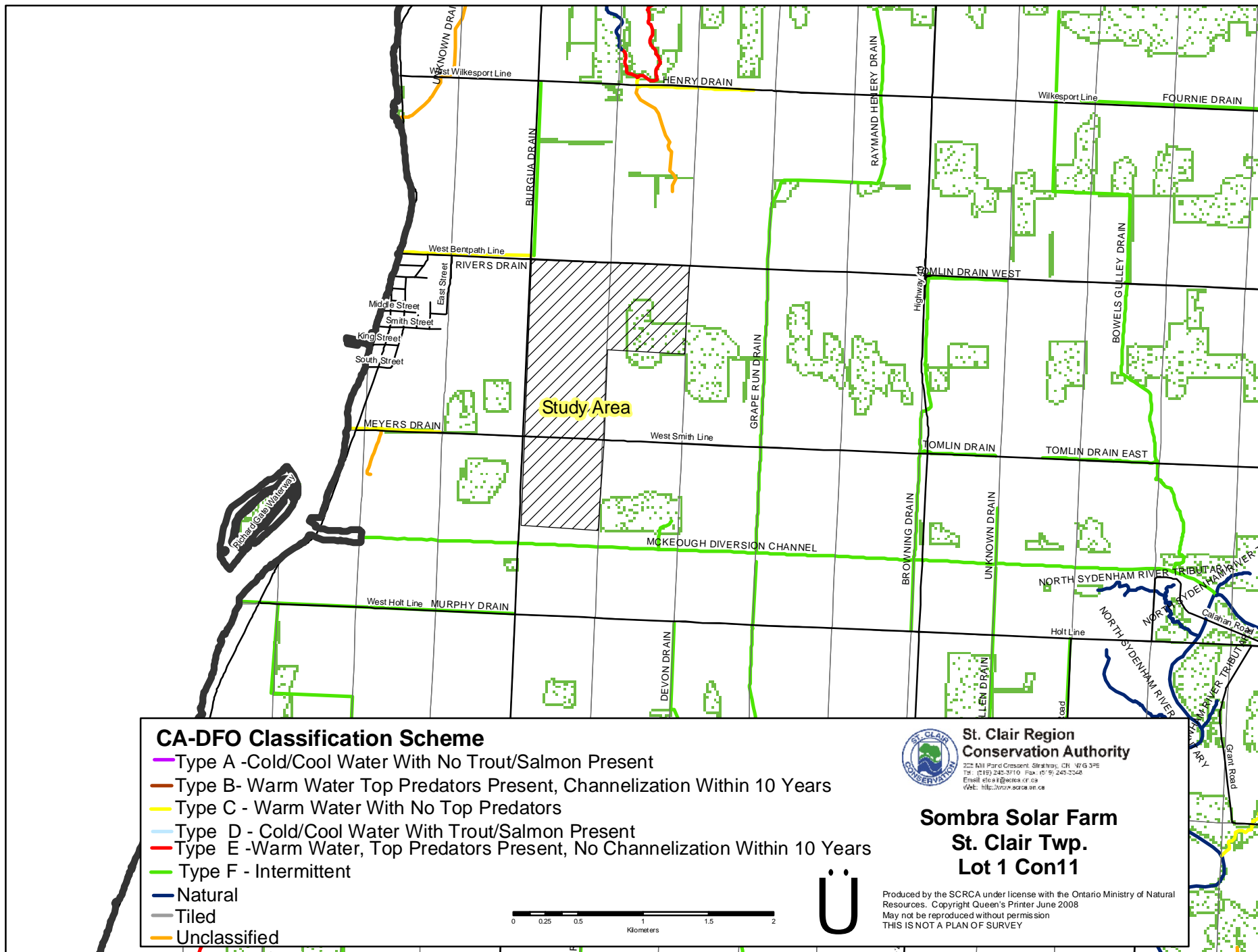
	<table border="1"> <tr> <td><b>PHOTOGRAPH</b></td> <td><b>7</b></td> </tr> </table>	<b>PHOTOGRAPH</b>	<b>7</b>
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<table border="1"> <tr> <td><b>Description</b></td> </tr> <tr> <td>Looking southwest across Bentpath Line at the Watson Tulloch open ditch and catchbasin associated with the drainage of the north half of the development Site.</td> </tr> </table>		<b>Description</b>	Looking southwest across Bentpath Line at the Watson Tulloch open ditch and catchbasin associated with the drainage of the north half of the development Site.
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	<table border="1"> <tr> <td><b>PHOTOGRAPH</b></td> <td><b>8</b></td> </tr> </table>	<b>PHOTOGRAPH</b>	<b>8</b>
<b>PHOTOGRAPH</b>	<b>8</b>		
<table border="1"> <tr> <td><b>Description</b></td> </tr> <tr> <td>Looking south at the catch basin which includes the subgrade drainage tile associated with the north half of the development site.</td> </tr> </table>		<b>Description</b>	Looking south at the catch basin which includes the subgrade drainage tile associated with the north half of the development site.
<b>Description</b>			
Looking south at the catch basin which includes the subgrade drainage tile associated with the north half of the development site.			



Appendix B  
St. Clair Region Conservation Authority – Drainage Classification Maps/Correspondence







## St. Clair Region Conservation Authority

205 Mill Pond Cr., Strathroy, ON, N7G 3P9  
(519) 245-3710 (519) 245-3348 FAX  
E-Mail [stclair@scrca.on.ca](mailto:stclair@scrca.on.ca)  
Website [www.scrca.on.ca](http://www.scrca.on.ca)

RECEIVED  
June 29/09

June 26, 2009

### Member Municipalities

Township of  
Adelaide-Metcalfe

Township of  
Brooke-Alvinston

Municipality of  
Chatham-Kent

Township of  
Dawn-Euphemia

Township of  
Enniskillen

Municipality of  
Lambton Shores

Township of  
Middlesex Centre

Village of  
Newbury

Village of  
Oil Springs

Town of  
Petrolia

Town of  
Plympton-Wyoming

Village of  
Point Edward

City of  
Sarnia

Municipality of  
Southwest Middlesex

Township of  
St. Clair

Township of  
Strathroy-Caradoc

Township of  
Warwick

Lakeshore Group  
250 Wellington Street West  
Suite 130  
Toronto, Ontario  
M5V 3P6

**Attention:** Rick Pennycooke, M.C.I.P., R.P.P., President

**Re: Property Inquiry**  
**Proposed Solar Farm Development**  
**Lot 1 & Part Lot 2, Concession 11**  
**Geographic Township of Sombra**

Staff of the St. Clair Region Conservation Authority (SCRCA) have reviewed the subject lands with regard to the matter outlined within your correspondence of June 16, 2009.

We understand that your client (First Solar Development (Canada) Inc) is proposing to develop a solar farm on the subject property. From the information provided, we understand the proposal includes the construction of a solar farm and associated infrastructure that would cover a majority of Lot 1, Concession 11, Sombra.

We can confirm that the subject lands are not impacted by "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" Regulations (O.R. 171/06) implemented by the Authority pursuant to Section 28 of the *Conservation Authorities Act*. As such, permission of the Authority is not required to complete the proposed development on the subject lands.

If you have any questions with regard to the above, do not hesitate to contact the undersigned.

Yours truly,

Jeff Lawrence  
Environmental Planner/Regulations Officer

member of

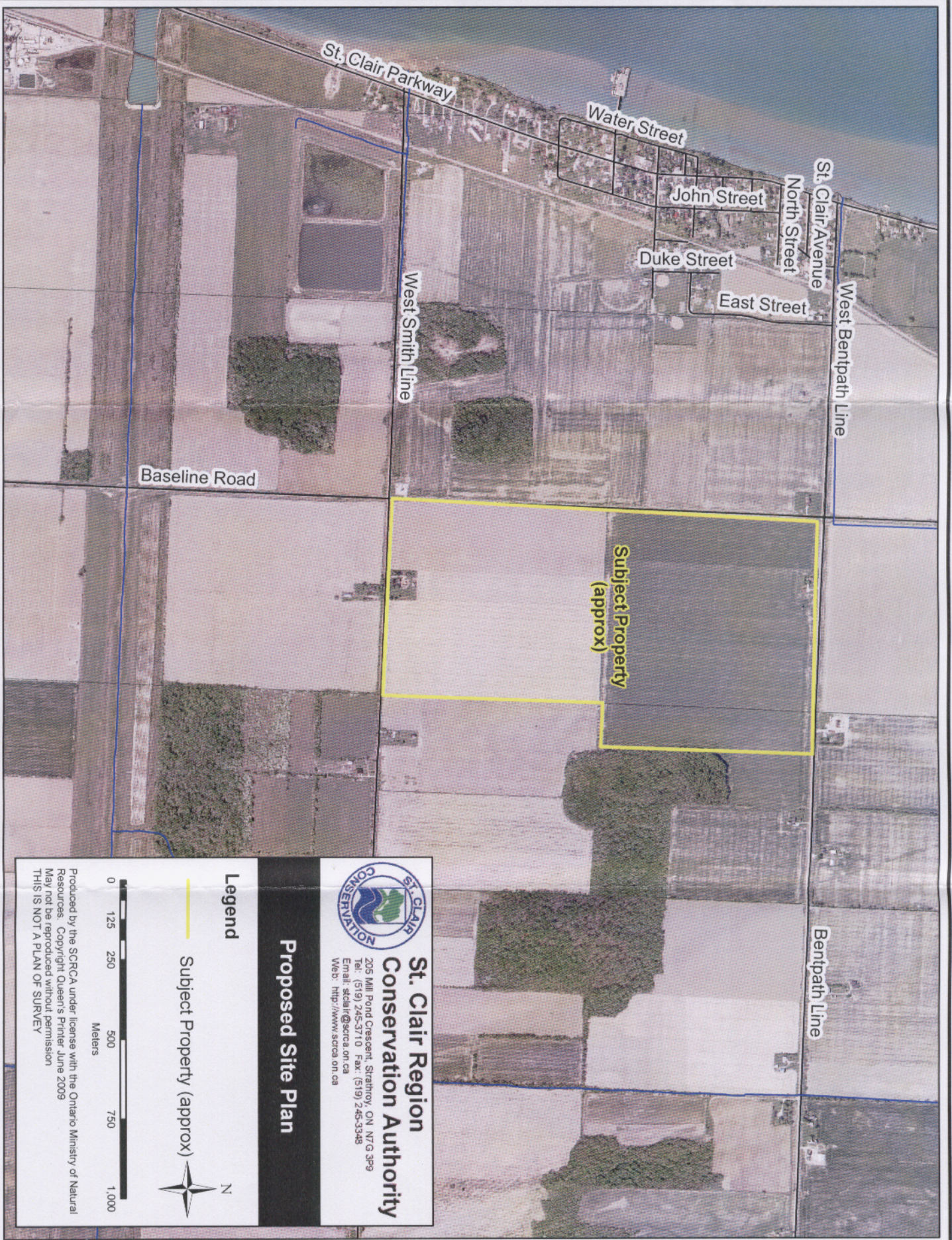


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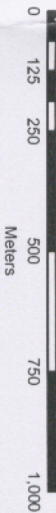
**St. Clair Region  
Conservation Authority**

205 Mill Pond Crescent, Stratford, ON N7G 3P9  
Tel: (519) 245-3710 Fax: (519) 245-3348  
Email: [stclair@scrc.ca](mailto:stclair@scrc.ca)  
Web: <http://www.scrc.ca>

**Proposed Site Plan**

**Legend**

— Subject Property (approx)



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