



**ST. COLUMBAN WIND PROJECT**  
**PROJECT DESCRIPTION REPORT**

File Number: 160960649  
June 2012

*Prepared for:*

**St. Columban Energy LP**  
Suite 900  
222-3<sup>rd</sup> Avenue SW  
Calgary, AB T2P 0B4

*Prepared by:*

**Stantec Consulting Ltd.**  
Suite 1 - 70 Southgate Drive  
Guelph ON N1G 4P5

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## **1.0 Introduction**

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### **1.1 PROJECT OVERVIEW**

St. Columban Energy LP is proposing to develop, construct, and operate the 33 megawatt (MW) St. Columban Wind Project (the Project) in the Municipality of Huron East (Huron East), Municipality of Morris-Turnberry (Morris-Turnberry), and Township of Howick (Howick), County of Huron (Huron County), in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province.

The overall Project Study Area is comprised of two sections – the Wind Project Study Area and the Interconnection Line Study Area. The Wind Project Study Area is bordered on the north by Winthrop Road, on the south by Huron Road/Highway 8, on the east to the west of Perth Road 180 and on the west by Maple Line. In addition, the Interconnection Line Study Area includes the path along which an approximately 43 kilometre (km) underground electrical interconnection line is proposed to extend from the Wind Project to a transformer station and one of two connection points to the existing Hydro One Networks Inc. (HONI) electrical distribution system.

The proposed Project Location for this report includes all parts of the land in, on or over which the Project is proposed (the 'construction area' for the Project). The proposed Project Location and Project Study Areas are shown in Appendix A, Figures 1-3.

The basic components of the Project include:

- 15 Siemens SWT 2.3-101/SWT 2.3-113 wind turbine generators with a maximum installed nameplate capacity of 33 MW. To be conservative, two turbine models were assessed as part of the Renewable Energy Approval (REA) process – the SWT 2.3-113 (113m blade span) and the SWT 2.3-101 (101m blade span). For the noise assessment, the SWT 2.3-101 was assessed, due to its higher noise level. For potential impacts to the natural environment, and property line setback assessments, the SWT 2.3-113 was assessed, due to its longer blade length. This conservative approach ensured the 'worst case scenario' was assessed;
- A 34.5 kV underground power line collector system;
- A 27.6 kV underground power line collector system;
- Fibre optic cabling laid with the underground collector lines;
- Turbine access roads;



- Crane pads;
- Two connection points to the existing electrical system;
- Two unserviced electrical control buildings;
- An existing, currently serviced, operations and maintenance building to be leased from a participating landowner;
- A 34.5kV - approximately 43 km underground electrical interconnection line; and,
- A 44 kV/34.5 kV 15/20 MVA transformer station.

Temporary components during construction include work and storage areas at the turbine locations and along the underground electrical interconnection line. The electrical power line collector system will transport the electricity generated from the Project to two connection points to the HONI local distribution system.

St. Columban Energy LP retained Stantec Consulting Ltd. (Stantec) to prepare the REA application with input from Zephyr North Ltd., and Archaeological Services Inc. The REA application is a requirement under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). According to subsection 6 (3) of O. Reg. 359/09, the Project is classified as a Class 4 Wind Facility and will follow the requirements identified in O. Reg. 359/09 for such a facility.

This draft Project Description Report has been prepared in accordance with O. Reg. 359/09, and is one component of the REA application for the Project. An Environmental Screening Report (ESR) was prepared, and a Notice of Completion was submitted in the fall of 2009 for the Wind Project Study Area. The current REA application used relevant information collected for the ESR, supplemented with new information when necessary, to maintain compliance with the new Regulation.

## **1.2 REPORT REQUIREMENTS**

The purpose of the Project Description Report is to provide the public, aboriginal communities, municipalities, and regulatory agencies with an understanding of the Project, including any environmental effect that may result from engaging in the Project.

The Project Description Report has been prepared in accordance with Item 10, Table 1 of O. Reg. 359/09, the Ministry of the Environment's (MOE's) *Technical Guide to Renewable Energy Approvals* (MOE 2011). O. Reg. 359/09 sets out specific content requirements for the Project Description Report as provided in Table 1.1.

**Table 1.1: Project Description Report Contents: O. Reg. 359/09**

Requirements	Completed	Section Reference
1. Any energy sources to be used to generate electricity at the renewable energy generation facility.	✓	3.1
2. The facilities, equipment or technology that will be used to convert the renewable energy source or any other energy source to electricity.	✓	3.3
3. If applicable, the class of the renewable energy generation facility.	✓	1.1
4. The activities that will be engaged in as part of the renewable energy project.	✓	3.5
5. The name plate capacity of the renewable energy generation facility.	✓	1.1
6. The ownership of the land on which the project location is to be situated	✓	3.2
7. Any negative environmental effects that may result from engaging in the project.	✓	3.0, Appendix B
8. An unbound, well marked, legible and reproducible map that is an appropriate size to fit on a 215 millimetre by 280 millimetre page, showing the project location and the land within 300 metres of the project location.	✓	Appendix A

## **2.0 General Requirements**

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### **2.1 PROJECT LOCATION**

The Project is located on privately-owned land and within municipal road allowances in Huron East, Morris-Turnberry, and Howick, Huron County, Ontario (Appendix A, Figures 1-3).

O. Reg. 359/09 defines the Project Location as:

*“a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project”.*

For the purposes of this Project, the Project Location (construction area) includes the footprint of the facility components, plus any temporary work and storage locations (Figures 1-3). The boundary of the Project Location is used for defining setback and site investigation distances according to O. Reg. 359/09 (the 300 m and 120 m Zone of Investigation shown on the Figures). The construction area would be delineated on private lands, and all construction and installation activities would be conducted within this designated area. Similarly, all installation activities related to collector and interconnection lines would be contained within the boundaries of the road allowance, in consultation with Huron East, Morris-Turnberry, Howick, and Huron County.

Although O. Reg. 359/09 considers the REA process in terms of the Project Location, the siting of wind projects is an iterative process, and final location of Project components is not available at Project outset. Therefore, a Project Study Area is developed to examine the general area within which the Project components may be sited; information gathered within this larger area feeds into the siting exercise. The Project Study Area for the wind project and the electrical interconnection line was determined through professional judgment and experience with the well-known and generally predictable environmental effects of the construction and operation of wind facilities and associated infrastructure.

The Wind Project Study Area is comprised of agricultural lands bordered south of Winthrop Road to the north, on the south by Huron Road/Highway 8, on the east by Perth Road 180, and on the west by Maple Line. The Study Area for the current assessment is slightly different than that for the Environmental Screening conducted in 2009 – the area is larger to incorporate new turbines, and to assure all relevant background information was collected for the REA application.

The Interconnection Line Study Area follows municipal roads in the Municipalities of Huron East and Morris-Turnberry, and the Township of Howick: Manley Line; Canada Company Road;

Beechwood Line; Blyth Road/Perth Line 55; McNabb Line; Browntown Road; Johnston Line; Centre Line Road; and McDonald Line to the proposed transformer station location at the south-east intersection of McDonald Line and Gough Road.

Project siting has been refined over the course of the Project assessment, and results can now be presented in terms of Project Location instead of Project Study Areas, although the Project Study Areas continue to be used for public notification.

## **2.2 CONTACTS**

### **Applicant**

The applicant/proponent for the Project is St. Columban Energy LP. The principle contact is:

Name: José Menéndez, P. Eng.  
St. Columban Energy LP  
Address: Suite 900, 222-3<sup>rd</sup> Avenue SW  
Calgary, AB T2P 0B4  
Telephone: (647) 654-3989  
Fax: (905) 264-9487  
Email: [jmenendez@vereseninc.com](mailto:jmenendez@vereseninc.com)

The principle Project consultant representing the applicant is:

Name: Shawna Peddle  
Stantec Consulting Ltd.  
Address: 70 Southgate Drive, Suite 1  
Guelph, ON N1G 4P5  
Telephone: (519) 836-6050  
Fax: (519) 836-2493  
Email: [shawna.peddle@stantec.com](mailto:shawna.peddle@stantec.com)

## **2.3 AUTHORIZATIONS REQUIRED**

At the federal, provincial and municipal level multiple permits, licenses and authorizations may be required to facilitate the development of the Project, in addition to the REA. The ultimate applicability of all permits, licenses and authorizations will be determined and based on the Project's detailed design.

### **2.3.1 Federal**

It is expected that a Federal Screening report will not be required for the Project, as it is not anticipated that the Project will cause a 'trigger' under the *Canadian Environmental Assessment Act* (CEAA), such as an Authorization by the Department of Fisheries and Oceans under the

*Fisheries Act*, or application for project funding under a future program similar to ecoEnergy for Renewable Power. However, the agency consultation program for the Project includes all federal departments and agencies typically interested in wind projects (e.g., Department of National Defence, Environment Canada, Transport Canada, etc.).

Federal permits, licenses and authorizations required for the Project may include those listed in Table 2.1.

**Table 2.1: Federal Permits, Licenses and Authorizations**

Permit /License/Authorization	Administering Agency	Rationale
Aeronautical Obstruction Clearance	Transport Canada – Aviation Division	Turbine lighting and marking
Scientific Collectors Permit under the <i>Migratory Bird Convention Act, 1994</i> (MBCA) and the federal <i>Species at Risk Act</i> (“SARA”)	Environment Canada/Canadian Wildlife Service	Will be required for collection of any bird or bat carcasses found during post construction monitoring programs
Land Use Clearance	NAV CANADA	Aeronautical safety mapping and designations

### 2.3.2 Provincial

Provincial permits, licenses and authorizations required for the Project may include those listed in Table 2.2.

**Table 2.2: Provincial Permits, Licenses and Authorizations**

Permit /License/Authorization	Administering Agency	Rationale
Approval of Connection	Independent Electricity System Operator (IESO)	Electrical interconnect with IESO regulated network
Connection Assessment	IESO	Integration of project with IESO-controlled transmission system
Certificate of Inspection	Electrical Safety Authority	A record that electrical work complies with the requirements of the Ontario Electrical Safety Code
Electrical Safety Inspection	Electrical Safety Authority	Required to connect to the grid. Focus on modifications, costs, timelines and responsibilities outlined in the Customer Impact Assessment.
Customer Impact Assessment (CIA)	HONI	Integration of project with HONI and effects to customers
System Impact Assessment (SIA)	IESO	Assesses to impact of the proposed project on the reliability of the integrated power system
Connection Cost Recovery Agreement (CCRA)	HONI	Recovery of costs to grid operator of changes to allow connection

**Table 2.2: Provincial Permits, Licenses and Authorizations**

Permit /License/Authorization	Administering Agency	Rationale
Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Permit	Maitland Valley Conservation Authority	Work within floodplains, water crossings, river or stream valleys, hazardous lands and within or adjacent to wetlands. Projects requiring review, <i>Fisheries Act</i> authorization and/or assessment under the <i>Canadian Environmental Assessment Act</i> are forwarded to the Department of Fisheries and Oceans (DFO)
Overall benefit permit under the Endangered Species Act	Ministry of Natural Resources	Permit to potentially impact habitat of Species at Risk
Notice of Project	Ministry of Labour	Notify the Ministry of Labour before construction begins
Change of Access and Heavy/Oversize Load Transportation Permit	Ministry of Transportation (MTO)	Compliance with provincial highway traffic and road safety regulations. Transportation of large or heavy items on provincial highways
Special vehicle configuration permit	MTO	Use of non-standard vehicles to transport large components
Transportation Plan	MTO	Adherence to road safety and suitability
Highway Entrance Permit	MTO	Entrance permit for new or upgraded road entrances onto a provincial highway Interference or obstruction of the highway
Generator's License	Ontario Energy Board (OEB)	Generation of electrical power for sale to grid

### 2.3.3 Municipal

Municipal permits, licenses and authorizations required for the Project may include those listed in Table 2.3.

**Table 2.3: Municipal and County Permits, Licenses and Authorizations**

Permit /License/Authorization	Rationale
Building Permit for turbines and buildings	Compliance with building codes
Municipal Consent – agreement on use of the municipal road allowance	Required for use of municipal road allowances for collector and interconnection line siting
Entrance Permits	Entrance from Municipal and/or County roads
Shared Use Agreement	Agreement with HONI. for shared use of poles in municipal road allowances
Road Condition Survey	Assessment of pre and post construction conditions of municipal roads to be used for material delivery and construction equipment movement
Traffic Management Plan	Adherence to road safety and suitability, including adherence to load restrictions on municipal roads
Demolition Permit	Required prior to the demolition of the project
Cost Recovery Agreement	To recover internal municipal costs in connection with the project such as building permits.
Sign Permit	As necessary

## **3.0 Project Information**

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### **3.1 ENERGY SOURCES**

Wind turbines capture the kinetic energy in surface winds and convert it into electrical energy in the form of electricity. In addition to the tower, wind turbines are comprised of three basic parts: blades, a shaft, and a generator. As wind moves over the turbine's blades it causes "lift"; the same effect used by airplane wings. This lift force causes the blade assembly to rotate. The rotational energy resulting from the movement of the blades is directly transferred to the drive shaft. The rotating shaft transfers the energy into an alternating current generator which then converts the mechanical energy into useable 60Hz electricity.

No supplementary fuel sources would be used to generate electricity for the Project.

### **3.2 LAND OWNERSHIP**

The Project would be situated exclusively on privately owned land and municipal road allowances. The legal description of the parcels of land that will be used for the Project will be provided as part of the REA application and is located in Appendix C to this report.

### **3.3 PROJECT COMPONENTS**

#### **3.3.1 Wind Turbine Generators**

The Project has two FIT contracts, and two separate connection points to the HONI system. St. Columban 1 (SC1 - 18 MW) and St. Columban 2 (SC2 - 15 MW) in aggregate combine 15 Siemens SWT 2.3-101/SWT 2.3-113 wind turbine generators with a maximum installed nameplate capacity of 33 MW. A summary of the basic specifications of a typical turbine model in this class is provided in Table 3.1, and coordinates for each turbine are provided in Table 3.2. Detailed information about the turbine model is provided in the [Wind Turbine Specifications Report](#).

**Table 3.1: Basic Wind Turbine Specifications**

<b>Manufacturer</b>	<b>Siemens</b>	<b>Siemens</b>
Model	SWT 2.3-113	SWT 2.3-101
Name plate capacity (MW)	2.3 MW	2.3 MW
Hub height above grade	99.5 m	99.5 m
Blade length	55 m	49 m
Full blade diameter	113 m	101 m
Blade sweep area	10,000 m <sup>2</sup>	8,000 m <sup>2</sup>
Speed range	6-13 rpm	6-16 rpm
Frequency spectrum	60 Hz	60 Hz

**Table 3.2: Turbine Coordinates**

<b>Turbine ID</b>	<b>St. Columban 1 (SC1) or 2 (SC2)</b>	<b>Collector System/Connection Voltage</b>	<b>Easting (X)</b>	<b>Northing (Y)</b>
1	SC1	34.5/44kV	475688	4819174
2	SC1	34.5/44kV	475982	4819564
3	SC1	34.5/44kV	476068	4820809
4	SC2	27.6/27.6 kV	476439	4821386
5	SC2	27.6/27.6 kV	477290	4822643
6	SC2	27.6/27.6 kV	474695	4824004
7	SC2	27.6/27.6 kV	475642	4823294
8	SC2	27.6/27.6 kV	476421	4822936
9	SC2	27.6/27.6 kV	476794	4824480
10	SC2	27.6/27.6 kV	476414	4824755
11	SC1	34.5/44kV	473668	4819851
12	SC1	34.5/44kV	473905	4820309
13	SC1	34.5/44kV	474447	4820173
14	SC1	34.5/44kV	474574	4819899
15	SC1	34.5/44kV	478016	4820440

The wind turbines consist of a 99.5 m steel tube tower (four sections), three blades (approximately 49 m to 55 m in length), the nacelle, hub, and step-up transformer. The turbine tower base is approximately 3 m in diameter and would be anchored to the concrete foundation using large diameter anchor bolts.

### **3.3.2 Electrical Infrastructure**

A step-up transformer at the base of each turbine is required to transform the electricity created in the nacelle to collector system voltages of either 34.5 kV (SC1) or 27.6 kV (SC2). From each step-up transformer underground 34.5 kV (SC1) or 27.6 kV (SC2) collector lines will be constructed parallel to the turbine access roads, along municipal road allowances, to one of two electrical control buildings located near the turbines for each of St. Columban 1 and St. Columban 2.

#### **St. Columban 1**

St. Columban 1 includes 8 Siemens SWT 2.3-101/SWT 2.3-113 wind turbine generators with a maximum installed nameplate capacity of 18 MW, turbine access roads, a 34.5 kV underground collector system with fibre optic cabling, and an unserviced electrical control building.

Approximately 11.6 km of 34.5kV underground collection lines will connect the turbines (T1, T2, T3, T11, T12, T13, T14, T15) to the unserviced electrical control building. This structure will measure approximately 6 m X 12 m, and will be located on private property near the entrance from Bridge Road to the turbine access road for T15.



A 34.5 kV - approximately 43 km buried electrical interconnection line will be installed from the electrical control building approximately 43 km to a 44 kV/34.5 kV 15/20 MVA transformer station for connection to the existing distribution system originating from HONI's Wingham Transformer Station (TS). The transformer station will occupy an area approximately 20 m X 30 m in size on private lands located south-east of the intersection of Gough Road and McDonald Road in the Township of Howick (43.847°N, -81.154°W). St. Columban Energy LP will construct and operate the electrical interconnection line, which would be buried in municipal road allowances. Potential impacts of construction, operation, and decommissioning of this line are assessed in the current REA application.

## **St. Columban 2**

St. Columban 2 includes 7 Siemens SWT 2.3-101/SWT 2.3-113 direct drive wind turbine generators with a maximum installed nameplate capacity of 15 MW, turbine access roads, a 27.6kV underground collector system with fibre optic cabling, and an electrical control building. Approximately 9.5 km of 27.6kV underground collection lines will connect the turbines (T4, T5, T6, T7, T8, T9, and T10) to the unserviced electrical control building for St. Columban 2. This structure will measure approximately 6 m X 12 m, located on private property near the entrance from Beechwood Line to the turbine access road for T8. A 30 m overhead line will be constructed to connect the buried cable emanating from the unserviced electrical control building to the HONI grid at the entrance from Beechwood Line to the turbine access road for T8 (43.560°N, -81.297°W).

HONI will then construct approximately 2.5 km of 27.6 kV overhead electrical interconnection line, beginning at the unserviced electrical control building at the entrance to Turbine 8 on Beechwood Line (500m north of Bridge Road) and running south to the existing HONI line at the intersection of Beechwood Line and Hydro Line Road (43.541°N, -81.315°W), originating from HONI's Seaforth TS. The overhead line is not a part of the renewable energy project being assessed as part of the REA application that is submitted to the Ministry of the Environment. The MOE's 2011 Technical Guide for Renewable Energy Approvals states, "For the purposes of the renewable energy approval, the lines built by the local distribution company in their distribution service area will not be considered part of the facility or project and a REA is not required to be obtained in respect of them". This line will be assessed and constructed by HONI, and will be assessed under their separate environmental assessment process. The line will also be installed using their preferred techniques (i.e., overhead).

All underground collector lines will be constructed on leased lands and within municipal road right-of-way (ROW). Wherever possible, underground collector lines on private lands will be aligned with the design of the access roads to reduce the area required for construction and minimize potential construction impacts. The cables will be installed immediately to one side of the access road, just off the graveled surface. In the municipal road ROW the cables are proposed to be installed just off the grass gravel interface at the edge of municipal roads,

subject to each municipality's agreement. Typically the collector lines will be buried at a minimum of 1.0 m.

Overhead lines are not anticipated to be required for the Project with the exception of the following:

1. 2.5 km overhead 27.6kV line to be constructed and owned by HONI to connect the St. Columban 2 turbines to HONIs existing distribution system at the intersection of Beechwood Line and Hydro Line Road, as described above; and,
2. Two 30 m sections of overhead line on private lands to bring the line to the proposed connection point to the HONI system from:
  - a. The buried cable emanating from the unserviced electrical control building at the entrance to Turbine 8 on Beechwood Line (500m north of Bridge Road) (St. Columban 1); and,
  - b. The buried cable emanating from the transformer station near the intersection of Belmore Line and Gough Road in the Township of Howick.

### **3.3.3 Electrical Interconnection Line**

The 34.5 kV - approximately 43 km electrical interconnection line to the Township of Howick will be buried for its entire length within a proposed location approximately near the grass gravel interface at the side of the road. The majority of the cable for the line will be plowed to a depth of at least 1.0 m, significantly reducing the need for open trenching.

Directional drilling, by which conduits and cables are installed along a prescribed bore path using a surface launched drilling rig with minimal impact on the surrounding area, would be used at water and road crossings, through other areas not conducive to 'plowed' installation (at the discretion of the contractor), and through the entire settlement of Cranbrook on McNabb Line. Approximately 1.6 km of underground drilling will be required in Cranbrook; the entrance and exit points for the cable would be spaced approximately 200-400 m apart, with pull and junction pits approximately 10 m long X 2 m wide.

For directionally-drilled watercourses, the two required drill pits (entrance and exit points for the conduit/cable) would be approximately 30 - 50 m from either side of the watercourse. For road crossings, the pits would be approximately 10 - 20 m from the outer ends of the ditch on either side of the road. The minimum depth below grade of conduits/cables installed using directional drilling techniques would be 1.0 m, with actual installed depths of typically about 1.2 m and up to 2.0 m under watercourses.

### **3.3.4 Access Roads and Crane Pads**

Existing provincial and municipal roads will be used to transport Project-related components, equipment and personnel to the Study Area. The Project would be situated exclusively on privately owned land and municipal road allowances. Access to these lands will be required for installation and operation of the wind turbines. Agricultural laneways are present in the vicinity of the Project and will be utilized and upgraded where possible. New laneways will be constructed as required and in consultation with landowners, to provide access to the individual turbine sites. Permanent access laneways will be approximately 6 m wide and would not require resizing for the operation phase, with the exception of entrances off municipal roads, which require wider turning radii during the construction phase.

Crane pads (30 m x 20 m) will be installed within the construction area adjacent to each turbine location prior to turbine erection, at the same time as the access roads. Generally, the process for crane pad construction will be the same as that for access roads; surface material will be stripped and stockpiled (topsoil separate from subsoil) and a gravel or stone base applied. The excavated soil will be re-used on site as feasible. Once turbine erection is complete, the gravel area around each turbine and the crane pads will be kept, while the remaining construction area will be rehabilitated to pre-existing conditions. Perimeter surface hydrology will be maintained during crane pad construction.

Construction of the Project components, and types of equipment that would be used, are described in the Construction Plan Report.

### **3.3.5 Water Crossings**

Four permanent culvert installations will be required for access roads and associated underground electrical collector lines/fibre optic cable in the vicinity of turbines T4, T6, T14, and T15. Where a culvert is being installed, a trench will be dug, the cables will be installed, and the culvert will be laid. Department of Fisheries and Oceans (DFO) Operational Statements will be followed for all works in watercourses.

Where underground collector lines and fibre optic cable cross watercourses and no culvert is required, the buried lines will be installed using directional drilling techniques in suitably sized plastic conduits at a sufficient depth below the watercourse to prevent any possibility of accidental damage due to dredging or over excavation. Signs indicating the presence and location of the cables will also be placed on either side of the watercourse.

All crossings will require permit approval from the Maitland Valley Conservation Authority. All temporary crossings would comply with the DFO's Ontario Operation Statement '*Temporary Stream Crossings*' where possible.

### **3.3.6 Electrical Control Buildings and Operations and Maintenance Building**

Two small unserviced electrical control buildings near the entrance to the turbine access roads for T8 and T15 will measure approximately 6 m X 12 m, and are anticipated to be prefabricated engineered structures with a concrete foundation that will extend below the frost line. The buildings will house electrical equipment such as isolation switches and protection and control equipment.

A serviced operations and maintenance facility, located at the access road entrance for T4 at Bridge Road (Figure 2) will be leased from a participating landowner. The building will include office and meeting facilities for maintenance staff, storage for small replacement parts, and Supervisory Control and Data Acquisition (SCADA) and electrical/mechanical monitoring systems. This building is serviced, and no additional infrastructure is required, with the exception of renovations to create office and storage spaces.

### **3.3.7 Transformer Substation**

A 44 kV/34.5 kV 15/20 MVA transformer substation will be constructed for connection to the existing distribution system originating from HONI's Wingham TS. The transformer substation will occupy an area approximately 20 m X 30 m in size on private lands located south-east of the intersection of Gough Road and McDonald Road in the Township of Howick (43.847°N, - 81.154°W).

Area drainage from the substation will be accomplished through swales/ditches adjacent to the proposed access road that will collect and convey runoff from the substation area and the associated access road. The total drainage area associated with the substation and access road "hard" surfaces is less than 2 ha and therefore a "wet" water quality control pond (i.e. one containing a permanent pool) is not required, as per the MOE *SWM Planning and Design Guidelines Manual* (2003). In addition to the conveyance of runoff, the swales will also provide water quality control, which is a suitable stormwater management practice for such an area according to the MOE guidelines.

Within the substation footprint itself, the transformer will be equipped with oil containment storage area to capture oil in the event of a leak. Additionally, an oil/water separator will be incorporated into the design to treat any effluent before it enters the storm drainage swales.

### **3.3.8 Met Tower**

St. Columban Energy LP has a 60 m tubular guyed met tower which was installed in 2005. This met tower has been used to identify the quality of the wind resource for the proposed Project. The wind data collected has been used to determine the suitability of the site. This tower is a prospecting tower and will be removed shortly following commercial operation. For operational purposes, meteorological equipment will be installed within the project boundary.

The meteorological equipment will be installed at or near hub height. The lighting requirements will depend on location and requirements of Navigation Canada and Transport Canada regulations. The permanent meteorological equipment will remain for the duration of the Project's operating life.

### **3.4 TEMPORARY COMPONENTS**

Lands to be temporarily used during construction include temporary construction facilities, staging areas for access roads and cable construction, drill pits for directional drilling, delivery truck turnaround areas, staging areas at each turbine, and crane laydown areas. Any temporary structures used during construction will not be serviced, and will be placed within delineated construction work areas.

The existing land use for the wind project is agricultural, and land for temporary components would be restored to an acceptable condition for its intended use in consultation with the landowners following the end of the construction phase. Restoration work will follow installation of each wind turbine and removal of all construction materials (including granular and geotextile material) and equipment from each turbine site. Restoration activities will follow the Site Restoration Plan in the Decommissioning Plan Report, and include de-compaction and reseeding as necessary.

#### **3.4.1 Turbine Locations**

##### **Turbine Staging Areas**

Turbine components will be delivered directly to the staging areas, and will be temporarily stored until assembled; there will be no central turbine laydown area. Turbine staging areas will be initiated in conjunction with turbine assembly, and areas impacted by construction activities would be restored to an acceptable condition for its intended use in consultation with the landowners following the end of the construction phase. Turbine staging areas would be actively used to varying degrees during all construction activities at the turbine siting areas.

#### **3.4.2 Access Road Locations**

##### **Staging Areas**

A staging area will be required for construction of the 6 m wide access road. The timing of the temporary use of land for the access road staging areas will begin with the construction of the access roads (anticipated Summer 2013) and these areas will be rehabilitated at the end of the construction phase. The duration of time that the land will be actively used is expected to be six to eight months.

### **Delivery Truck Turnaround Areas**

All sites require turnaround areas for delivery trucks. These turnaround areas will be the same width as access roads, with turning radii, and will be constructed in the same manner, including the requirement for staging areas.

The timing of the temporary use of land for the delivery truck turnaround areas will begin with the construction of the access roads (anticipated Spring 2013) and these areas would be restored to an acceptable condition for its intended use in consultation with the landowners at the end of the construction phase. The duration of time that the land will be actively used is expected to be six to eight months.

### **Access Road Entrances**

Access road entrances require a wider turning radius for construction/delivery vehicles. Entrances will be approximately 30 m wide during the construction phase, and reduced to 6 m at the end of the construction phase. All dimensions will be discussed with the municipality during the municipal consultation and permitting process.

## **3.5 PROJECT SCHEDULE**

Table 3.3 provides an overview of the projected dates associated with the REA phase of the Project.

<b>Table 3.3: Project Schedule Overview</b>	
<b>Milestone</b>	<b>Approximate Date</b>
Initiate Public REA Process	February 2011
REA technical studies	2010-2011
Public Open House #1	May 2011
Public Open House #2 (for interconnection line)	January 2012
Draft REA Reports to Public	March 2012
Final Public Open House (#3)	May 2012
Submission of REA application to the MOE	June 2012
REA Decision	Late 2012
Start of Construction	July 2013
Commercial Operation Date (COD)	Early 2014
Repowering/Decommissioning	Approximately 20.5 years after COD

## 3.6 PROJECT ACTIVITIES

### 3.6.1 Description of Regulated Activities

A general overview of the activities that would be engaged in during construction, operation, and decommissioning of the Project are provided in Table 3.4. More specific details on the Project phases and related activities are outlined in Construction Plan Report, Design and Operations Report, and Decommissioning Plan Report.

**Table 3.4: Key Project Activities**

Project Phase	Activities
<b>Construction</b>	<b>Turbine Sites</b>
	Delineation and staking of temporary work areas
	Completion of necessary site grading
	Access road construction and culvert installation
	Installation of tower foundations
	Installation of crane pads
	Installation of underground collector lines
	Turbine component deliveries and offloading
	Turbine assembly and erection
	Interconnection to HONI electrical grid
	Restoration of temporary work areas (de-compaction, topsoil replacement, possible reseeding, etc.)
	<b>Transformer Substation and Electrical Control Buildings</b>
	Installation of transformer station
	Construction of operation and maintenance buildings
	Restoration of temporary work areas (de-compaction, topsoil replacement, possible reseeding, etc.)
	Site landscaping (possible planting of trees and/or shrubs)
	<b>Additional Activities</b>
	Component transportation to Project Location
	Installation of collector and interconnection lines in municipal road allowances
<b>Operation</b>	<b>Turbine Sites</b>
	Preventative and routine maintenance
	Unplanned maintenance
	Meter calibrations
	Grounds keeping
	<b>Transformer Substation and Electrical Control Buildings</b>
	Preventative and routine maintenance
	Unplanned maintenance
	<b>Additional Activities</b>
	Collector and interconnection line maintenance
<b>Decommissioning</b>	<b>Turbine Sites</b>
	Removal of tower and turbine infrastructure
	Turbine site grading (dependent upon new proposed use)
	Possible removal of access roads dependent upon agreement with landowner



**Table 3.4: Key Project Activities**

Project Phase	Activities
	Possible excavation and removal of underground collector lines depending upon depth and agreement with property owner
	Disconnection from electrical grid
	<b>Transformer Station and Electrical Control Buildings</b>
	Removal of transformer station and operation and maintenance buildings
	<b>Additional Activities</b>
	Component removal and reuse, recycling, or proper disposal
	Removal of collector and interconnection lines in municipal road allowances (remove wires and poles as required)

### 3.6.2 Facility Phases, Timing and Scheduling

The projected starting dates for Project construction, operation and decommissioning activities are provided in Table 3.5 below.

The construction schedule is detailed in the Construction Plan Report. Operation and maintenance activities will occur as required throughout the life of the Project, and are detailed in the Design and Operations Report. While the specific schedule for decommissioning will be determined at the time it is undertaken, the general staging of undertakings is outlined in the Decommissioning Plan Report.

The wind turbines can be expected to be in service for the term of the 20 year Ontario Power Authority Feed-In Tariff contract. Following the term of the contract, a decision would be made regarding whether to extend the life of the facility or to decommission. Barring routine scheduled maintenance, the turbines are expected to be operational 24 hours a day, 7 days a week, assuming appropriate wind conditions.

**Table 3.5: Construction Activities – Projection and Schedule**

Construction Phase Details	Schedule	Duration
<b>Turbine Sites</b>		
Delineation and staking of temporary work areas	July 2013	2 weeks
Access road construction	July-August 2013	6 weeks
Component transportation to Project Location	November 2013	4 weeks
Installation of tower foundations	September – October 2013	8 weeks
Installation of substation and construction of electrical control buildings	September – October 2013	8 weeks
Installation of crane pads	October 2013	2 weeks
Installation of underground collector lines parallel to access roads	August - October 2013	8 weeks
Installation of collector and interconnection lines in municipal road allowances	August - November 2013	12 weeks
Turbine delivery, assembly and erection	October – December 2013	12 weeks



**Table 3.5: Construction Activities – Projection and Schedule**

Construction Phase Details	Schedule	Duration
Interconnection to the existing HONI electrical grid	December 2013	1 week
Restoration of temporary work areas (de-compaction, topsoil replacement, reseeding, etc.)	November - December 2013	8 weeks

*Note: Construction activities will take place during regular construction hours. When construction is anticipated to be required outside of these hours, the timing will be discussed in advance with Huron East, Morris-Turnberry, Howick and Huron County.*

### **3.6.3 Waste Generation**

#### **Construction and Decommissioning**

During construction and decommissioning, waste material would be generated at, and transported from, the Project Location. Waste material produced is expected to consist of construction material (e.g. excess fill, soil, brush, scrap lumber and metal, banding, plastic wrap removed from palletized goods, equipment packaging, grease and oil, steel, etc.) and a small amount of domestic waste (i.e. garbage, recycling and organics).

All wastes will be handled and recycled or disposed of in accordance with regulatory requirements.

#### **Operation**

Lubricating and hydraulic oils associated with turbine maintenance and operation will generate waste materials, such as oily rags, empty grease/oil containers, and cleaning fluids in low volumes. Oil changes are scheduled in accordance with the annual oil analysis findings. Used oil will be stored in a designated area, and picked up by a licensed contractor with the appropriate manifests in place.

A small amount of domestic waste (i.e. garbage, recycling, and organics) will be generated during standard operation and maintenance activities. All wastes will be handled and recycled or disposed of in accordance with regulatory requirements. Further details on waste management and disposal will be developed during the REA process.

### **3.6.4 Air Emissions and Dust Generation**

#### **Construction and Decommissioning**

Construction and decommissioning activities will require a wide range of mobile equipment, such as bulldozers, dump trucks, directional drill equipment, and cranes. The engine exhaust from these vehicles, especially from those operating on diesel fuel, represents a source of particulate and other emissions.

Construction related traffic and various construction activities (e.g. excavation, grading, soil stripping and exposed areas) have the potential to create nuisance dust in the immediate vicinity of the Project.

## **Operation**

During operations minor localized air emissions would occur from the periodic use of maintenance equipment and personnel vehicles. Operations traffic has the potential to create nuisance dust in the immediate vicinity of the Project; however, effects are anticipated to be short-term in duration and highly localized.

An examination of the Project's air emissions was undertaken in context of the requirements of O. Reg. 419/05 Air Pollution – Local Air Quality, and will be provided in the Design and Operations Report. It was determined that since O. Reg. 419/05 does not apply to discharges of contaminants from motor vehicles, and all other facility sources can be considered negligible, no further assessment is required.

### **3.6.5 Noise Emissions**

#### **Construction and Decommissioning**

During construction of the Project, noise would be generated by the operation of heavy equipment and associated vehicular traffic on-site and on haul routes. All emissions will be managed within the limits set by regulatory requirements.

#### **Operation**

Mechanical and aerodynamic noise will be emitted from the wind turbines. A Noise Assessment Report has been completed for the Project in accordance with the MOE document “*Noise Guidelines for Wind Farms*”, dated October 2008 and O. Reg. 359/09, and will be provided as an appendix in the Design and Operations Report.

Based upon the Project design, the analysis carried out in the Noise Assessment Report indicates that noise produced by the Project would be within the acceptable limits established by the MOE at all noise receptors within the Wind Project and Interconnection Line Study Areas.

### **3.6.6 Hazardous Materials**

#### **Construction and Decommissioning**

Hazardous materials are limited to fuels and lubricants that would be on-site for use in equipment. These materials will be stored in appropriate storage containers by the construction contractor. Designated storage areas and the type of storage areas will be confirmed prior to construction. Disposal of any hazardous materials will be in accordance with regulatory requirements.

#### **Operation**

Hazardous materials are limited to lubricants and fluids for the operation and maintenance of the turbines. Designated storage areas and the type of storage areas will be confirmed prior to

operations. There are no other known hazardous by-products of the wind energy generation process itself.

### **3.6.7 Sewage and Stormwater Management**

#### **Construction and Decommissioning**

Sanitary waste generated by the construction and decommissioning crew will be collected via portable toilets and wash stations supplied by the construction contractor. Disposal of these wastes will be the responsibility of the contracted party and will be done in accordance with regulatory requirements.

During construction and decommissioning, proper grading would be conducted and mitigation measures implemented to reduce potential for stormwater runoff at the work areas.

#### **Operation**

Sanitary waste generated at the O&M building will be managed by a dedicated, previously-installed septic system. No stormwater management activities are required as part of the operation of the Project.

### **3.6.8 Water-taking Activities**

#### **Construction and Decommissioning**

Depending on groundwater levels, some dewatering activities may be required during turbine foundation excavation and installation of underground collector lines; however, withdrawal amounts are anticipated to be below 50,000 l/d, and therefore will not require a Permit to Take Water (PTTW) from the MOE.

#### **Operation**

Potable water for use in the O&M building will be provided by a previously-dug well. No groundwater or surface water-taking activities are planned as part of the operation of the Project.

## **4.0 Description of Potential Environmental Effects**

---

### **4.1 POTENTIAL ENVIRONMENTAL EFFECTS**

Based on the current understanding of the potential effects of constructing, operating, and decommissioning a wind project, Project-specific issues and potential effects have been identified (see Appendix B). Appendix B1 describes potential effects and mitigation measures for construction and decommissioning of the Project, and Appendix B2 describes potential effects and mitigation measures for operation and maintenance of the Project. Appendix B3 outlines monitoring plans for the construction, operation and decommissioning of the Project. Detailed descriptions of all potential effects, mitigation measures, and monitoring plans are provided in the following reports:

- Construction Plan Report;
- Design and Operations Report, includes:
  - Preliminary Property Line Setback Assessment;
  - Noise Assessment;
- Decommissioning Plan Report;
- Natural Heritage Assessment / Environmental Impact Study (NHA/EIS);
- Water Assessment / Water Body Report (WA/WBR);
- Heritage Assessment Report;
- Protected Properties Assessment;
- Stage I Archaeology Assessment; and
- Stage II Archaeological Resources Assessment Report.

The Project maps (Appendix A) show the Project Location for the Wind and Electrical Interconnection components, including proposed infrastructure and natural features within the Project Location. Setback areas, as defined by O. Reg. 359/09, are also shown. Where Project infrastructure is within a setback, additional analysis is provided within the NHA/EIS and WA/WBR.

Monitoring plans have been developed for the various stages of the Project and are identified within the Construction Plan Report, Design and Operations Report, and NHA/EIS. This includes the identification of performance objectives, monitoring requirements, contingency plans, as well as various management systems/programs/plans/procedures. A Complaint Response Protocol has also been developed and will be implemented during all stages of the Project's lifecycle.

## **4.2 PROJECT RELATED SETBACKS**

A key component of the REA process is the establishment of common setbacks for all renewable energy facilities in the Province. The Project was designed to meet the mandatory setbacks within O. Reg. 359/09 in all cases. Within the Regulation there are some setbacks for which studies that identify potential negative environmental effects and mitigation measures can be conducted in lieu of meeting the setback requirements. In some instances in the proposed design, Project components are proposed within the defined setbacks for natural features, water bodies and property lines. In these instances, additional assessments have been conducted as per the requirements of O. Reg. 359/09 and results have established that impacts would be low or not expected. The results of the assessments are provided in the NHA/EIS, the WA/WBR, and the Property Line Setback Assessment which is provided as an appendix to the Design and Operations Report.

## **5.0 Closure**

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The Project Description Report for the St. Columban Wind Project has been prepared by Stantec for St. Columban Energy LP in accordance with Ontario Regulation 359/09, and *Technical Guide to Renewable Energy Approvals* (MOE, 2011).

This report has been prepared by Stantec for the sole benefit of St. Columban Energy LP, and may not be used by any third party without the express written consent of St. Columban Energy LP. The data presented in this report are in accordance with Stantec's understanding of the Project as it was presented at the time of reporting.

### **STANTEC CONSULTING LTD.**



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**Shawna Peddle**  
Senior Project Manager

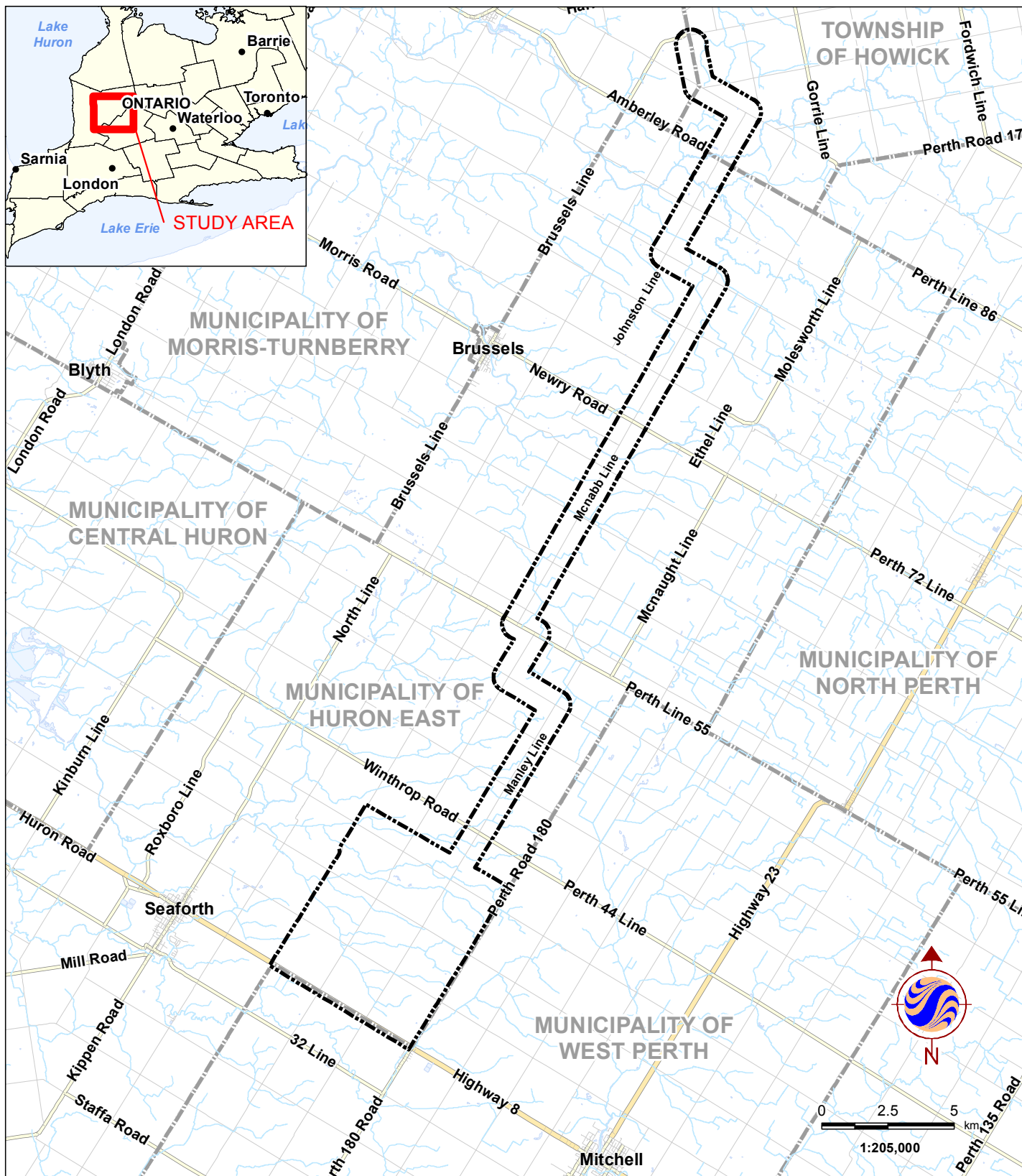


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**Kerrie Skillen**  
Project Manager

# **Appendix A**

## **Project Location**



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Revised: 2012-06-07 By: dhanvee

June, 2012  
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## Legend

- |            |                    |
|------------|--------------------|
| Study Area | Municipal Boundary |
| Highway    | Watercourse        |
| Major Road | Waterbody          |
| Local Road |                    |

## Notes

1. Coordinate System: UTM Zone 17 Northern Hemisphere
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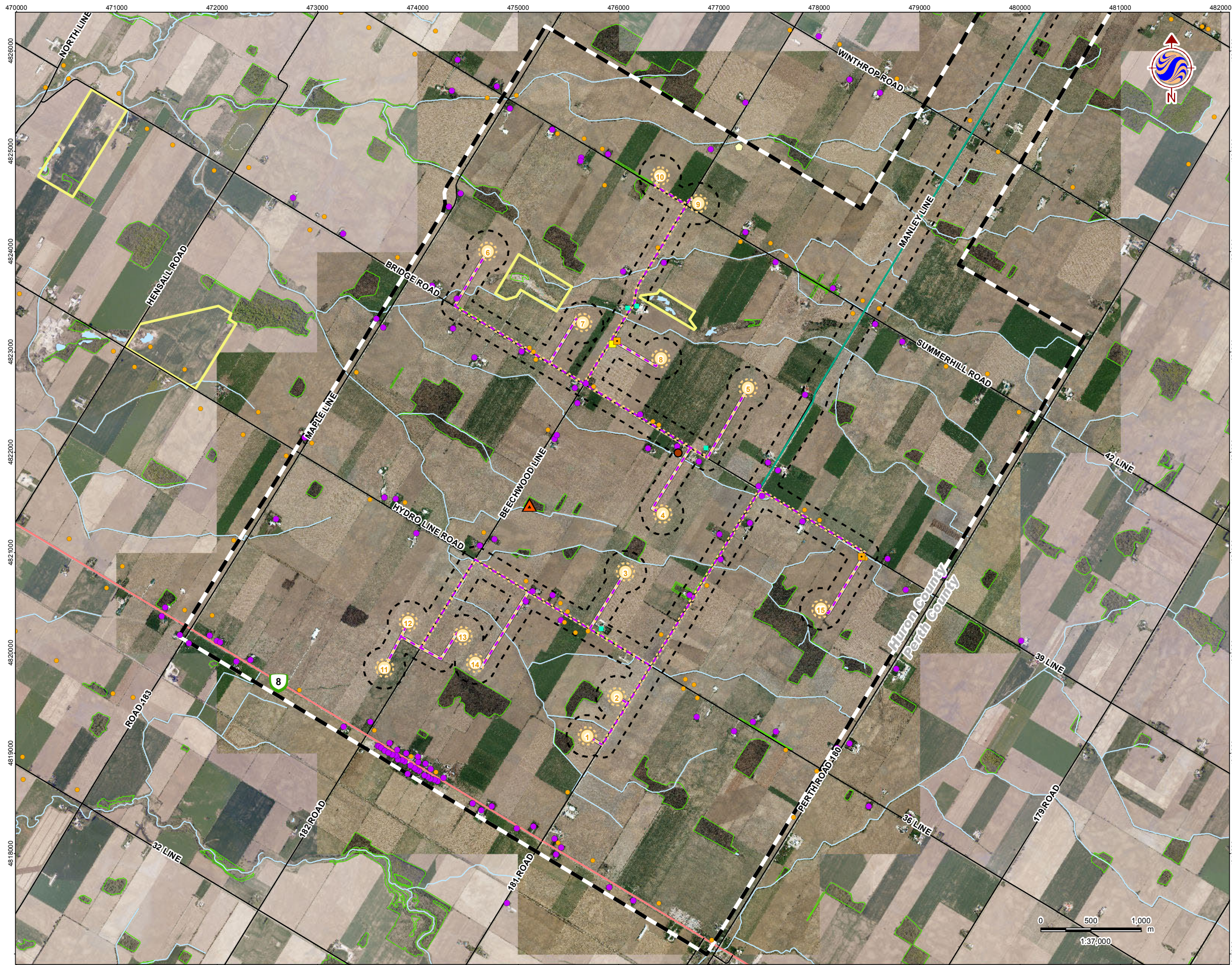
Figure No.

1

Title

**PROJECT LOCATION**





**Legend**

Study Area

120m Zone of Investigation

**Project Components**

Turbine Location

Construction Area

Access Road

Proposed Underground Electrical Interconnection Line Route

Underground Collector

Operations and Maintenance Building

Point of Connection to HONI Network

Met Tower

Unserviced Electrical Control Building

**Existing Features**

Bell Communication Tower

Highway

Road

Watercourse

Waterbody

Aggregate Site

Wooded Area

**Noise Receptors (As defined under O.Reg 359/109)**

Participating

Non-Participating

Vacant Lot



- Notes**
1. Coordinate System: UTM NAD 83 - Zone 17 (N).

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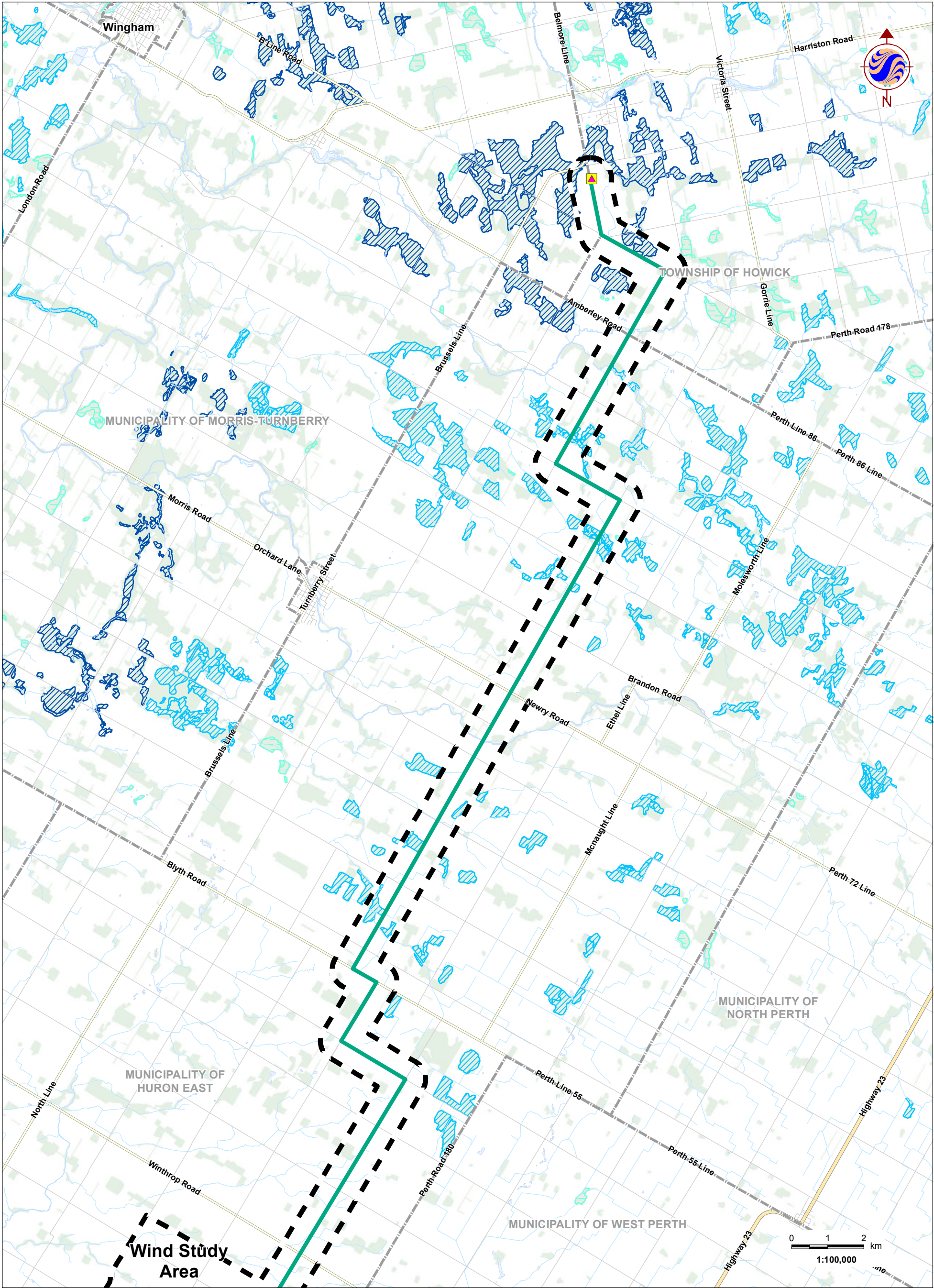
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Figure No.  
2.0

Title  
**WIND PROJECT LOCATION**



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Revised: 2012-06-07 By: charvey



June, 2012  
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### Legend

- Study Area
- Project Components
  - Proposed Interconnection Line
  - Transformer Substation
  - Point of Connection to HONI Network

### Existing Features

- Highway
- Major Road
- Local Road
- Municipal Boundary
- Wooded Area
- Watercourse
- Waterbody
- Provincially Significant Wetland
- Locally Significant Wetland
- Other Wetland

Client/Project

ST. COLUMBAN ENERGY LP  
ST. COLUMBAN WIND PROJECT

Figure No.

3.0

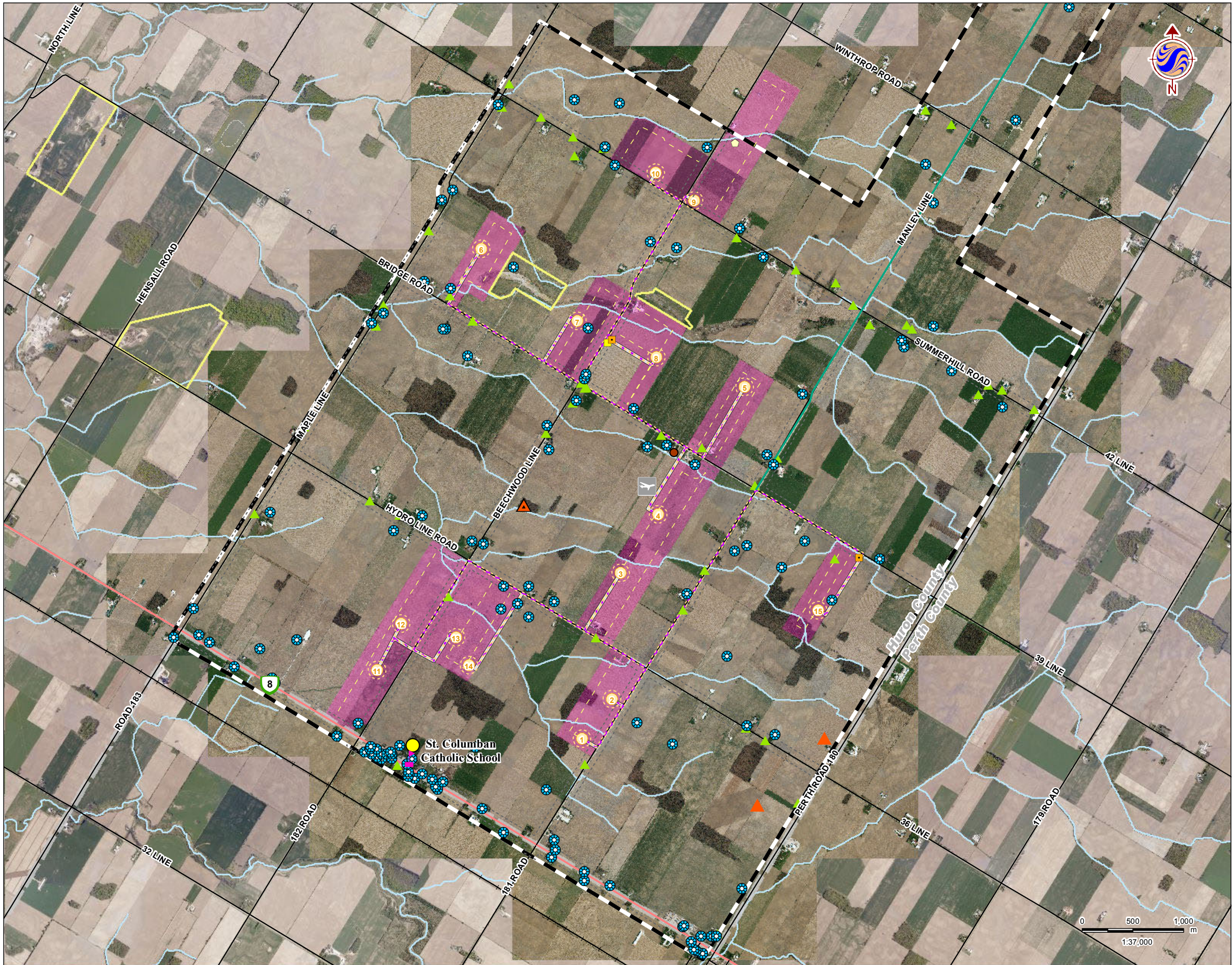
Title

## UNDERGROUND ELECTRICAL INTERCONNECTION LINE PROJECT LOCATION

### Notes

- Coordinate System: NAD 1983 UTM Zone 17N
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### Legend

Study Area

#### Project Components

Turbine Location

Construction Area

Access Road

Proposed Underground Electrical Interconnection Line Route

Underground Collector

Operations and Maintenance Building

Point of Connection to HONI Network

Met Tower

Unserviced Electrical Control Building

#### Existing Features

Bell Communication Tower

Highway

Road

Abandoned Petroleum Well

Heritage Resources

Airstrip

School

Soccer Field

Water Well

Railway

Aggregate Site

Watercourse

Optioned Property

#### Setback

Road Setback (65m)

Property Line Setback (99.5m)

### Notes

1. Coordinate System: UTM NAD 83 - Zone 17 (N).

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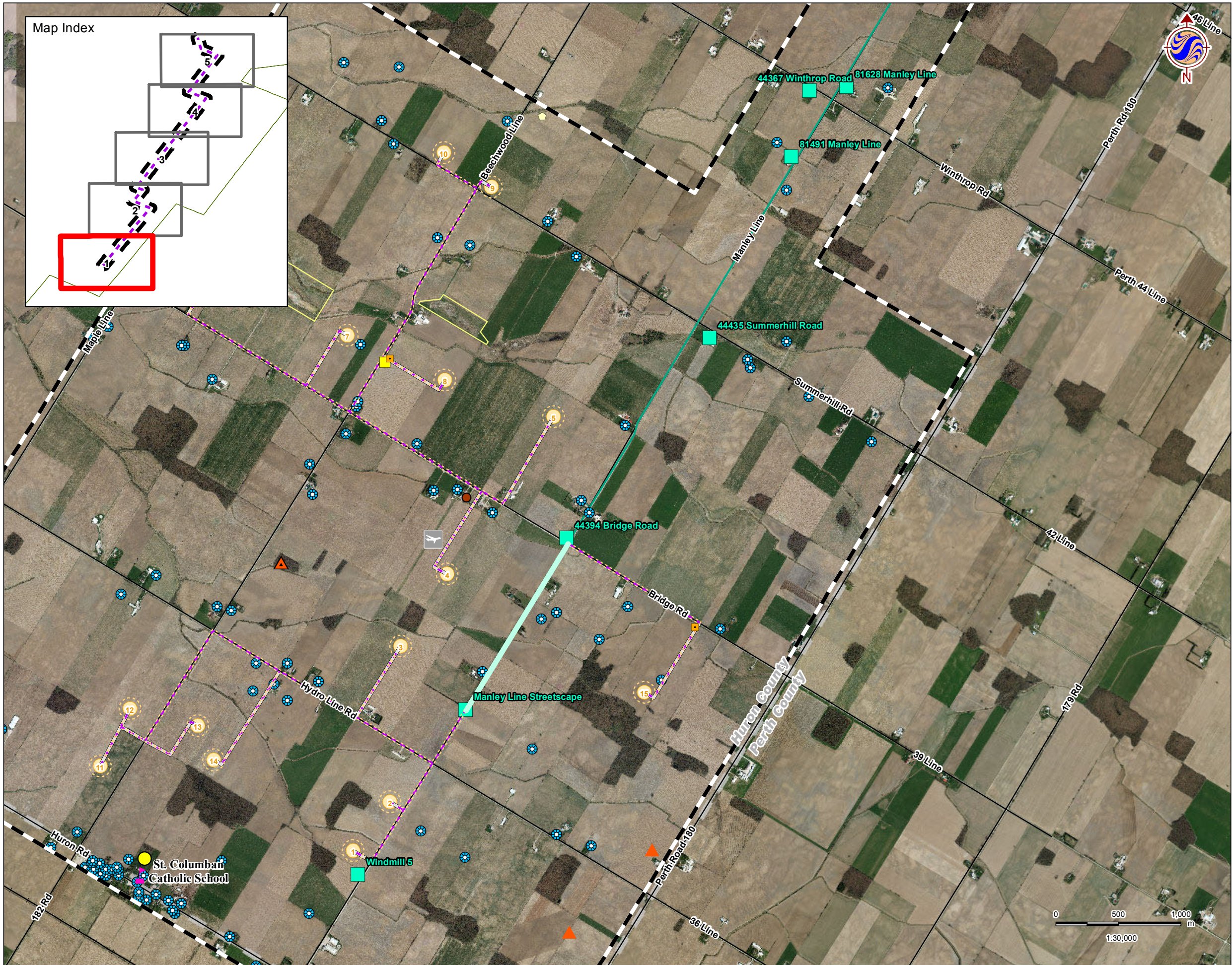
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Figure No.  
4.0

Title  
**SOCIO-ECONOMIC FEATURES  
WIND PROJECT LOCATION**

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Revised: 2012-06-07 By: dharvey





## Legend

- Study Area**
- Study Area
- Project Components**
- Turbine Location
  - Construction Area
  - Access Road
  - Proposed Underground Electrical Interconnection Line Route
  - Underground Collector
  - Transformer Substation
  - Operations and Maintenance Building
  - Point of Connection to HONI Network
  - Unserviced Electrical Control Building
  - Met Tower
- Existing Features**
- Bell Communication Tower
  - Road
  - Railway
  - Aggregate Site
  - Heritage Resources
  - Cultural Heritage Landscape
  - Abandoned Petroleum Well
  - Water well (Identified by member of public not in MOE Water Well Records)
  - Airstrip
  - School
  - Soccer Field
  - Water Well (MOE)

## Notes

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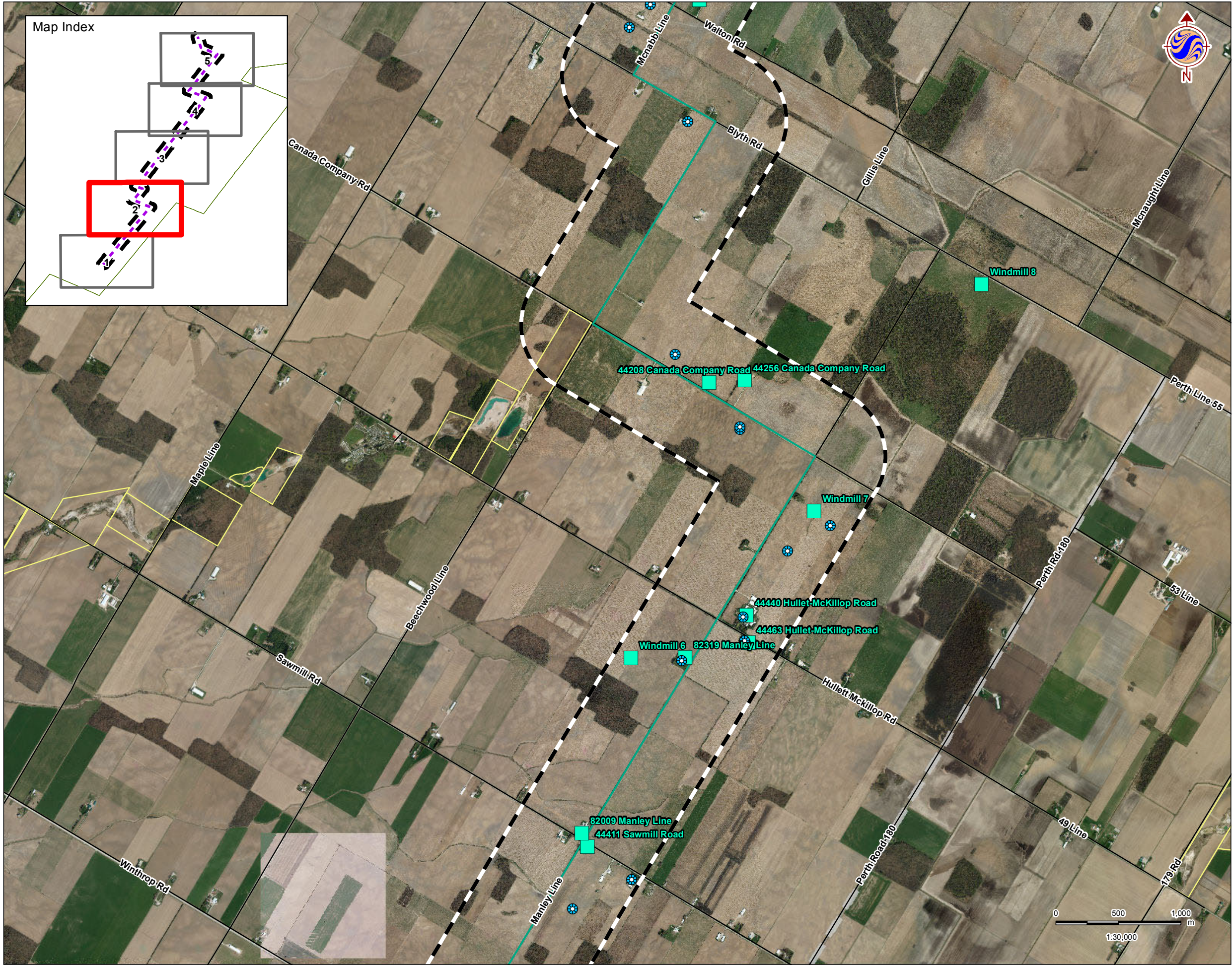
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Figure No.  
5.0

Title  
**SOCIO- ECONOMIC FEATURES  
UNDERGROUND ELECTRICAL  
INTERCONNECTION LINE PROJECT  
LOCATION (Tile 1 of 5)**





## Legend

- Study Area
- Project Components
  - Turbine Location
  - Construction Area
  - Access Road
  - Proposed Underground Electrical Interconnection Line Route
  - Underground Collector
  - Transformer Substation
  - Operations and Maintenance Building
  - Point of Connection to HONI Network
  - Unserviced Electrical Control Building
  - Met Tower
- Existing Features
  - Bell Communication Tower
  - Road
  - Railway
  - Aggregate Site
  - Heritage Resources
  - Cultural Heritage Landscape
  - Abandoned Petroleum Well
  - Water well (Identified by member of public not in MOE Water Well Records)
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  - School
  - Soccer Field
  - Water Well (MOE)

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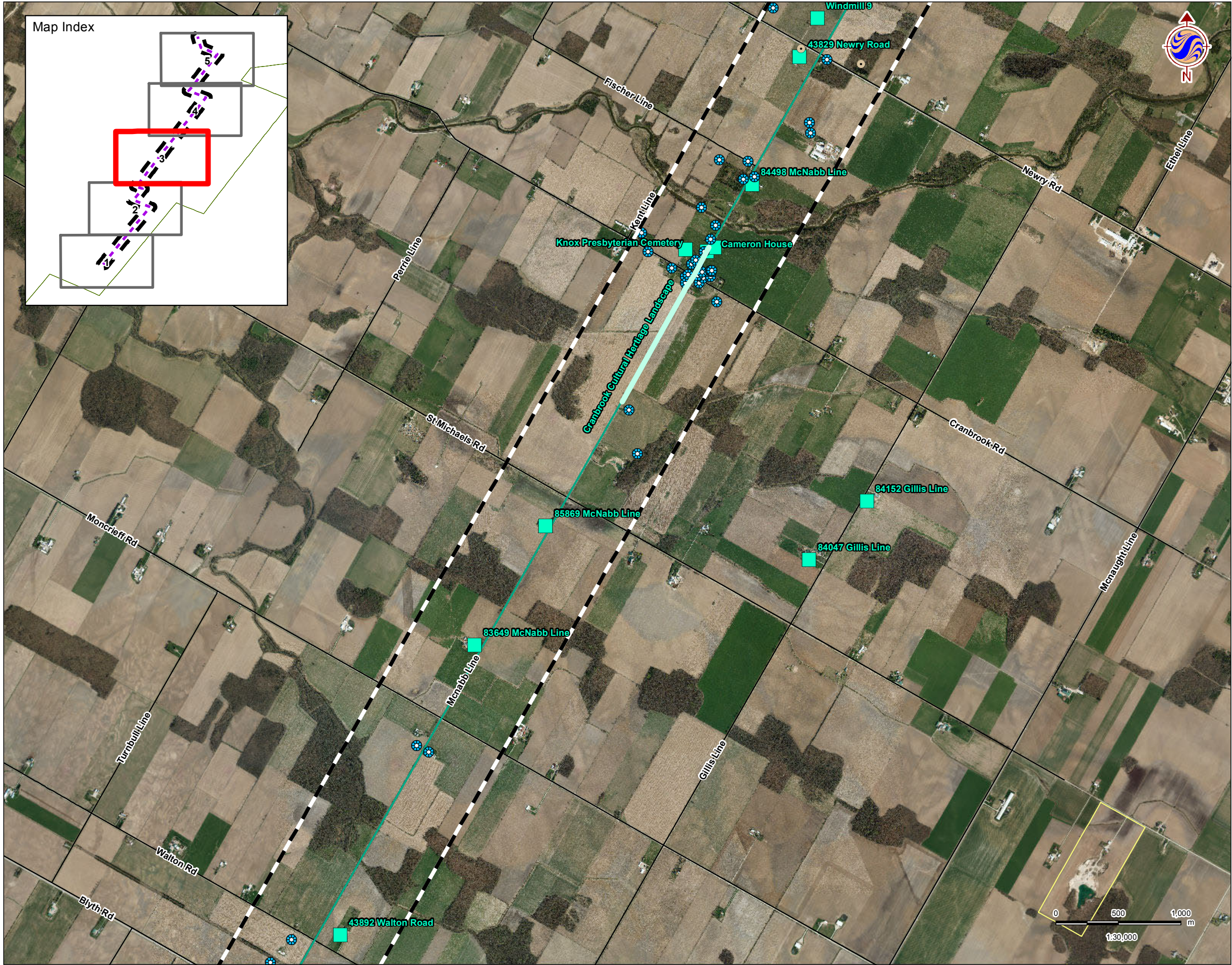
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ST. COLUMBAN WIND PROJECT

Figure No.  
5.0

Title  
**SOCIO- ECONOMIC FEATURES  
UNDERGROUND ELECTRICAL  
INTERCONNECTION LINE PROJECT  
LOCATION (Tile 2 of 5)**





## Legend

- Study Area
- Project Components**
  - Turbine Location
  - Construction Area
  - Access Road
  - Proposed Underground Electrical Interconnection Line Route
  - Underground Collector
  - Transformer Substation
  - Operations and Maintenance Building
  - Point of Connection to HONI Network
  - Unserviced Electrical Control Building
  - Met Tower
- Existing Features**
  - Bell Communication Tower
  - Road
  - Railway
  - Aggregate Site
  - Heritage Resources
  - Cultural Heritage Landscape
  - Abandoned Petroleum Well
  - Water well (Identified by member of public not in MOE Water Well Records)
  - Airstrip
  - School
  - Soccer Field
  - Water Well (MOE)

## Notes

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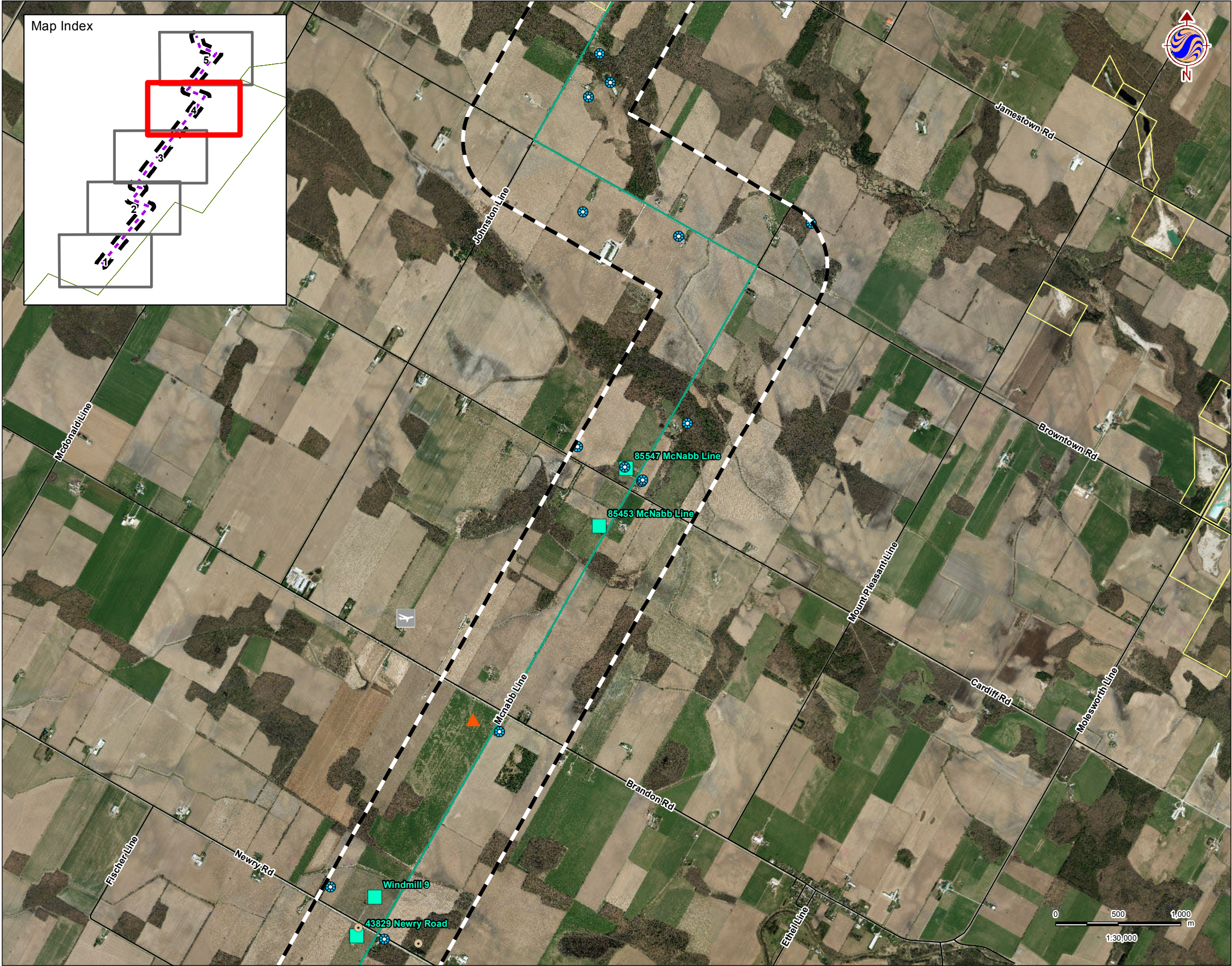
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Figure No.  
5.0

Title  
**SOCIO- ECONOMIC FEATURES  
UNDERGROUND ELECTRICAL  
INTERCONNECTION LINE PROJECT  
LOCATION (Tile 3 of 5)**





## Legend

- Study Area**
- Study Area
- Project Components**
- Turbine Location
  - Construction Area
  - Access Road
  - Proposed Underground Electrical Interconnection Line Route
  - Underground Collector
  - Transformer Substation
  - Operations and Maintenance Building
  - Point of Connection to HONI Network
  - Unserviced Electrical Control Building
  - Met Tower
- Existing Features**
- Bell Communication Tower
  - Road
  - Railway
  - Aggregate Site
  - Heritage Resources
  - Cultural Heritage Landscape
  - Abandoned Petroleum Well
  - Water well (Identified by member of public not in MOE Water Well Records)
  - Airstrip
  - School
  - Soccer Field
  - Water Well (MOE)

## Notes

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ST. COLUMBAN WIND PROJECT

Figure No.  
5.0

Title  
**SOCIO- ECONOMIC FEATURES  
UNDERGROUND ELECTRICAL  
INTERCONNECTION LINE PROJECT  
LOCATION (Tile 4 of 5)**





## Legend

- Study Area**
- Study Area
- Project Components**
- Turbine Location
  - Construction Area
  - Access Road
  - Proposed Underground Electrical Interconnection Line Route
  - Underground Collector
  - Transformer Substation
  - Operations and Maintenance Building
  - Point of Connection to HONI Network
  - Unserviced Electrical Control Building
  - Met Tower
- Existing Features**
- Bell Communication Tower
  - Road
  - Railway
  - Aggregate Site
  - Heritage Resources
  - Cultural Heritage Landscape
  - Abandoned Petroleum Well
  - Water well (Identified by member of public not in MOE Water Well Records)
  - Airstrip
  - School
  - Soccer Field
  - Water Well (MOE)

## Notes

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ST. COLUMBAN WIND PROJECT

Figure No.  
5.0

Title  
**SOCIO- ECONOMIC FEATURES  
UNDERGROUND ELECTRICAL  
INTERCONNECTION LINE PROJECT  
LOCATION (Tile 5 of 5)**





**Legend**

Study Area

**Project Components**

Turbine Location

Construction Area

Access Road

Proposed Underground Electrical Interconnection Line Route

Underground Collector

Operations and Maintenance Building

Point of Connection to HONI Network

Met Tower

Unserviced Electrical Control Building

**Existing Features**

Highway

Road

Railway

Optioned Property

**Noise Receptors (As defined under O.Reg 359/109)**

Participating

Non-Participating

Vacant Lot

- Notes**
1. Coordinate System: UTM NAD 83 - Zone 17 (N).

2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.

3. Orthographic Imagery: © Huron County, First Base Solutions  
Imagery Date: 2010 & 2006.



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ST. COLUMBAN ENERGY LP  
ST. COLUMBAN WIND PROJECT

Figure No.  
6.0

Title  
**NOISE RECEPTORS  
WIND PROJECT LOCATION**





## Legend

- Study Area
- 120m Zone of Investigation
- Project Components**
  - Turbine Location
  - Operations and Maintenance Building
  - Point of Connection to HONI Network
  - Unserviced Electrical Control Building
  - Met Tower
  - Construction Area
  - Proposed Underground Electrical Interconnection Line Route
  - Underground Collector
  - Access Road
- Existing Features**
  - Highway
  - Road
  - Railway
  - Regionally Significant Earth Science ANSI
  - Aggregate Site
  - Watercourse
  - REA Waterbody (as defined in O.Reg 359/09)
  - Waterbody
  - Wooded Area
  - Significant Natural Features
  - Contour Line (Metres)

## Notes

- Coordinate System: UTM NAD 83 - Zone 17 (N).
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Imagery Date: 2006, 2010



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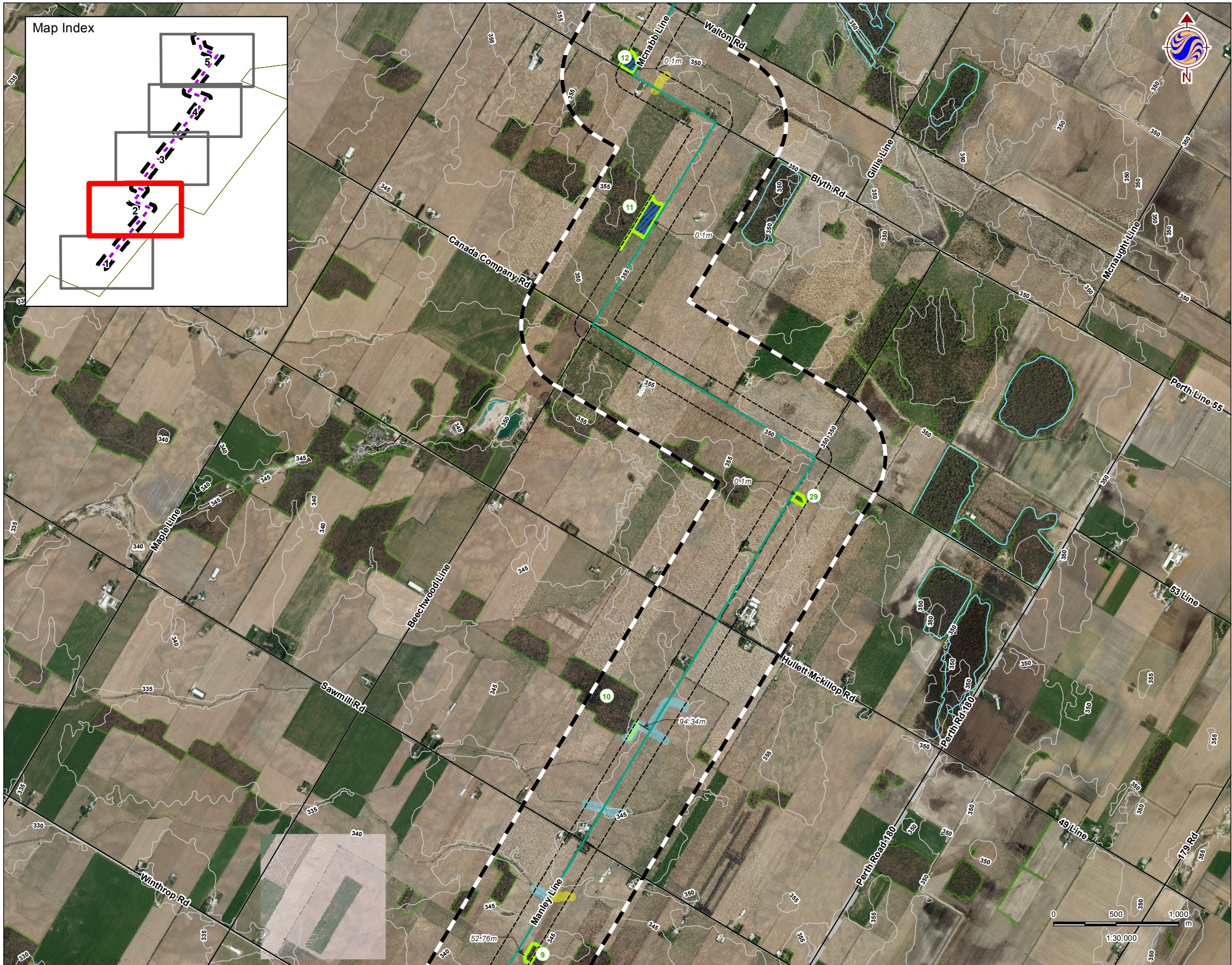
Figure No.  
7.0

Title  
**NATURAL HERITAGE FEATURES  
WIND PROJECT LOCATION**









Legend

- Study Area
- 120m Zone of Investigation
- Project Components**
- Turbine Location
  - Transformer Substation
  - Operations and Maintenance Building
  - Point of Connection to HONI Network
  - Unserviced Electrical Control Building
  - Met Tower
  - Proposed Underground Electrical Interconnection Line Route
  - Wind Construction Area
- Existing Features**
- Road
  - Railway
  - Contour Line (Metres)
  - Regionally Significant Life Science ANSI (MNR, 2011)
  - Provincially Significant Wetland (MNR, 2011)
  - Locally Significant Wetland (MNR, 2011)
  - Other Wetland (MNR, 2011)
  - Winter Deer Yard (MNR, 2011)
  - Wooded Area (MNR, 2011)
  - Water Body (as defined in O.Reg 359/09)
  - Not Water Body (as defined in O.Reg 359/09)
- Significant Natural Features**
- Significant Woodlands and Generalized Candidate Significant Wildlife Habitat (Stantec, 2011)
  - Significant Wetlands and Generalized Candidate Significant Wildlife Habitat (Stantec, 2011)
  - Winter Deer Yards and Generalized Candidate Significant Wildlife Habitat (Stantec, 2011)
  - Natural Feature Number

Notes

- Coordinate System: UTM NAD 83 - Zone 17 (N).
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ST. COLUMBAN ENERGY LP  
ST. COLUMBAN WIND PROJECT

Figure No.  
8.0

Title  
**NATURAL HERITAGE FEATURES  
UDERGROUNDELECTRICAL  
INTERCONNECTION LINE  
PROJECT LOCATION (Tile 2 of 5)**















## **Appendix B**

### **Overview of Potential Environmental Effects**



**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
<b>Heritage and Archaeological Resources</b>			
Protected Properties and Heritage Resources	<ul style="list-style-type: none"> <li>• None anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction and decommissioning to be undertaken in such a way as to minimize impacts to the cultural heritage features inventoried in the <u>Heritage Impact Assessment</u>.</li> <li>• Care should be taken during construction to monitor noise and vibration levels to avoid damaging structures that abut the municipal road allowance where construction activities are undertaken.</li> </ul>	N/A
Archaeological Resources	<ul style="list-style-type: none"> <li>• Damage of buried artefacts during excavation.</li> </ul>	<ul style="list-style-type: none"> <li>• Stage 1 and 2 archaeological assessments have been undertaken.</li> <li>• Construction Contractor would be notified of the stop work protocol should artefacts and/or human remains be encountered during excavation as described in the <u>Construction Plan Report</u>.</li> </ul>	None
<b>Natural Heritage Resources</b>			
Wetlands	<ul style="list-style-type: none"> <li>• Two wetlands within 120 m of the Wind Project Location and 17 wetlands within the Interconnection Line Project Location conservatively evaluated as significant using provincial guidance.</li> <li>• No direct loss of wetland habitat or function as a result of the Project.</li> <li>• Indirect impacts from dust, sedimentation and erosion, and the potential for accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed mitigation measures for the Project are provided in the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS).</li> <li>• No development would occur within the significant wetland boundary.</li> <li>• Where possible, and as appropriate, access roads will be constructed at or near existing grade to maintain surface flow contributions to wetland.</li> <li>• Work areas would be staked and Contractor would ensure all activities occur within staked area.</li> <li>• All fuel storage away from wetlands. In the event of an accidental spill, the MOE Spills Action Centre would be contacted as appropriate and emergency spill procedures implemented immediately.</li> <li>• Mitigation measures related to dust are outlined in '<u>Dust and Odour Emissions</u>'</li> <li>• Directional boring is recommended where heavily vegetated (ie. trees and shrubs) areas are immediately adjacent to the road ROW to avoid damage to treed vegetation (applies to features 12, 13, 15 and 19)</li> </ul>	None

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
Areas of Natural and Scientific Interest (ANSIs)	<ul style="list-style-type: none"> <li>• No features identified within 300 m of the Project Location.</li> <li>• One regionally significant Life Science ANSI was identified within 120 m of the Interconnection Line Project Location</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	N/A
Valleylands and Hazard Lands	<ul style="list-style-type: none"> <li>• No features identified within 300 m of the Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	N/A
Woodlands	<ul style="list-style-type: none"> <li>• Six woodland features identified as occurring within 120m of the Wind Project Location, two of which determined to be significant</li> <li>• 19 woodland features identified as occurring within 120m of the Interconnection Line Project Location,</li> <li>• Indirect impacts due to dust, or sedimentation and erosion</li> <li>• During construction, potential for disturbance due to increased traffic and potential for accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed mitigation measures for the Project are provided in the <u>Natural Heritage Assessment and Environmental Impact Study (NHA/EIS)</u>.</li> <li>• Project has been sited to avoid woodlands.</li> <li>• No habitat removal of woodland.</li> <li>• Inspectors would ensure construction vehicles and personnel stay within the demarcated areas, thereby limiting the disturbance of natural vegetation.</li> <li>• In the event of an accidental spill, the MOE Spills Action Centre would be contacted as appropriate and emergency spill procedures implemented immediately.</li> <li>• Mitigation measures related to dust are outlined in '<i>Dust and Odour Emissions</i>'.</li> </ul>	None
Provincial Parks and Conservation Reserves	<ul style="list-style-type: none"> <li>• No features identified within 300 m of the Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	N/A
Other Designated Natural Areas	<ul style="list-style-type: none"> <li>• No features identified within 300 m of the Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	N/A
Significant Wildlife and Wildlife Habitat ( <i>Significant Wildlife</i> )	<ul style="list-style-type: none"> <li>• Information has been provided to the MNR as part of the Approval and Permitting requirements Document (APRD) for Renewable Energy</li> </ul>	<ul style="list-style-type: none"> <li>• Consultation is ongoing with the Ministry of Natural Resources regarding species at risk. Prior to construction and decommissioning, all applicable permits and approvals would be obtained, and all conditions contained within permits and approvals would be implemented.</li> </ul>	Any adverse net effects due to construction or decommissioning activities are anticipated to be minimal in magnitude, short-term in

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	Projects requirements		duration and intermittent. Post-construction disturbance and mortality monitoring will be conducted to verify effects predictions and additional operational mitigation will be implemented if unanticipated effects occur.
Significant Wildlife and Wildlife Habitat ( <i>Animal Movement Corridors</i> )	<ul style="list-style-type: none"> <li>No features identified within 300 m of the Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	N/A
Significant Wildlife and Wildlife Habitat ( <i>Winter Deer Yard</i> )	<ul style="list-style-type: none"> <li>One winter deer yard identified within 120m of the Interconnection Line Project Location</li> </ul>	<ul style="list-style-type: none"> <li>Detailed mitigation measures for the Project are provided in the <u>Natural Heritage Assessment and Environmental Impact Study</u> (NHA/EIS).</li> <li>Avoid construction during season when deer are present and using deer yard</li> </ul>	None
Significant Wildlife and Wildlife Habitat ( <i>Amphibian Breeding</i> )	<ul style="list-style-type: none"> <li>Woodland containing significant wildlife habitat (amphibian breeding ponds) within 120 m of the Project Location.</li> <li>No direct loss of amphibian breeding habitat as a result of the Project.</li> <li>Indirect impacts from dust, sedimentation and erosion, and the potential for accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>Detailed mitigation measures for the Project are provided in the <u>Natural Heritage Assessment and Environmental Impact Study</u> (NHA/EIS).</li> <li>No development would occur within the amphibian breeding ponds.</li> <li>Work areas would be staked and Contractor would ensure all activities occur within staked area.</li> <li>All fuel storage away from wetlands. In the event of an accidental spill, the MOE Spills Action Centre would be contacted as appropriate and emergency spill procedures implemented immediately.</li> <li>Mitigation measures related to dust are outlined in '<i>Dust and Odour Emissions</i>'</li> </ul>	None
Significant Wildlife and Wildlife Habitat ( <i>Area Sensitive Species and</i>	<ul style="list-style-type: none"> <li>No features identified within 300 m of the Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	N/A

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
<i>Declining Species)</i>			
Generalized Candidate Significant Wildlife Habitat	<ul style="list-style-type: none"> <li>Generalized candidate significant wildlife habitat within 120 m of the Project Location is assumed to be present and must be treated as significant</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	None
Other Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> <li>Clearing activities during construction will result in removal of vascular plants and portions of plant communities (ie. hedgerows)</li> <li>Vehicle movements within the Project Study Area may disturb local wildlife</li> <li>Sensory disturbance of wildlife may occur as a result of increased on-site human activities.</li> <li>Potential effects to bats are expected to be negligible.</li> <li>Disturbance of birds from traffic, dust or noise.</li> </ul>	<ul style="list-style-type: none"> <li>A certain level of sensory disturbance to wildlife in the Project Study Area already exists from ongoing agricultural activities and local road traffic.</li> <li>Vegetation clearing within the municipal road right-of-way will be revegetated in consultation with Huron East and Huron County.</li> <li>Mitigation measures related to additional traffic are provided in 'Local Traffic'.</li> <li>Mitigation measures related to noise from construction and decommissioning activities are outlined in 'Environmental Noise'.</li> <li>Mitigation measures related to dust are outlined in 'Dust and Odour Emissions'.</li> </ul>	<p>There is some potential for disturbance to wildlife as a result of increased human activity, particularly increased traffic.</p> <p>Some limited mortality is possible.</p> <p>Long-term effects to wildlife populations from mortality and from barrier effects are anticipated to be minimal because of the temporary nature of the increased traffic activity.</p>
Significant Flora and Vegetation Communities	<ul style="list-style-type: none"> <li>No features identified within 300 m of the Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>Consultation is ongoing with the Ministry of Natural Resources regarding threatened and endangered species. Prior to construction and decommissioning, all applicable permits and approvals would be obtained, and all conditions contained within permits and approvals would be implemented.</li> </ul>	N/A
Other Flora and Vegetation Communities	<ul style="list-style-type: none"> <li>Clearing activities during construction will result in the removal of vascular plants and portions of plant communities (ie. hedgerows)</li> <li>Potential indirect effects from dust.</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation clearing within the municipal road ROW will be revegetated in consultation with Huron East and Huron County.</li> <li>The Construction Contractor will ensure that no construction disturbance occurs beyond the construction envelope.</li> <li>All disturbed areas will be revegetated as soon as conditions allow.</li> <li>Mitigation measures related to dust are outlined in 'Dust and Odour Emissions'.</li> </ul>	Effects are expected to be short-term in duration and spatially limited to the work areas and their immediate vicinity.

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
<b>Water Bodies and Aquatic Resources</b>			
Groundwater	<ul style="list-style-type: none"> <li>Some dewatering activity possible during excavations; would not exceed 50,000 litres (L) per day.</li> <li>Potential for contamination through accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>If groundwater is encountered during excavations, good practices would be used, including the following key measures: <ul style="list-style-type: none"> <li>– minimizing the length of time that the excavation is open;</li> <li>– monitoring seepage into the excavation;</li> <li>– energy dissipation techniques would be used for any pumped water to reduce the potential for erosion and sourcing; and</li> <li>– If energy dissipation measures are found to be inadequate, the rate of dewatering would be reduced or ceased until satisfactory mitigation measures are in place.</li> </ul> </li> <li>Mitigation measures related to accidental spills are outlined in 'Accidental Spills'.</li> </ul>	Any net effects would be localized, temporary, and would have little to no effect on groundwater flow conditions or adjacent private water wells.
Surface Water, Fish and Fish Habitat	<ul style="list-style-type: none"> <li>Seven watercourses are present within 120 m of the Wind Project location, all of which were determined to contain fish habitat</li> <li>24 watercourses were identified within 120 m of the Interconnection Line Project Location, all of which were determined to contain fish habitat</li> <li>Construction activities could impact watercourses, including vegetation removal, removal and reinstallation of existing culverts, installation of new culverts and placement of underground collector lines.</li> <li>All activities could result in sediment release into the watercourse and erosion of the</li> </ul>	<ul style="list-style-type: none"> <li>Sedimentation and Erosion: the Contractor would implement best practice sedimentation and erosion control measures as described in the <u>Construction Plan Report</u>. Key measures include: <ul style="list-style-type: none"> <li>– Barrier installation (e.g. silt fencing);</li> <li>– Minimizing vegetation removal on slopes; and,</li> <li>– Proper stockpiling of erodible materials;</li> </ul> </li> <li>Mitigation measures related to accidental spills are outlined in 'Accidental Spills'.</li> <li>Mitigation measures for underground installation are included in the <u>Water Assessment and Waterbody Report</u>, and in the <u>Construction Plan Report</u>.</li> <li>Culverts must be designed and installed such that there is no: <ul style="list-style-type: none"> <li>– Restriction of flows through the culvert resulting in upstream pooling;</li> <li>– Erosion at the culvert inlets and outlets; and,</li> <li>– Barrier to fish passage to upstream environments.</li> </ul> </li> </ul>	Any potential net effects would be spatially and temporally limited.

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
	<p>streambank, causing degradation of fish habitat.</p> <ul style="list-style-type: none"> <li>• Culvert installations may enclose portions of a watercourse, cause loss of bed material within the length of the culvert and cause changes to riparian vegetation within the road allowance.</li> </ul>		
<b>Air Quality and Environmental Noise</b>			
Air Emissions	<ul style="list-style-type: none"> <li>• The engine exhaust from vehicles represents a source of particulate and other emissions.</li> <li>• Traffic delays result in increased emissions from vehicles traveling slowly through construction zones.</li> <li>• The delivery of materials can generate emissions, especially for sites that are relatively far from material manufacturers.</li> </ul>	<ul style="list-style-type: none"> <li>• Multi-passenger vehicles should be utilized to the extent practical.</li> <li>• Company and contractor personnel should avoid idling of vehicles when not necessary for construction activities.</li> <li>• Equipment and vehicles should be turned off when not in use unless required for activities and/or effective operation.</li> <li>• Equipment and vehicles should be maintained in good working order with functioning mufflers and emission control systems as available.</li> <li>• All vehicles should be fitted with catalytic converters as required.</li> <li>• All construction equipment and vehicles should meet the emissions requirements of the Ministry of the Environment (MOE) and/or Ministry of Transportation (MTO).</li> <li>• As appropriate, records of vehicle maintenance should be retained and made available for periodic review by the Contractor.</li> <li>• All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practicable.</li> </ul>	Limited to the work areas, and the magnitude of combustion emissions are limited. Any adverse net effects are anticipated to be short-term in duration and highly localized.
Dust and Odour Emissions	<ul style="list-style-type: none"> <li>• Winds may erode and disperse loose soil material, storage piles and road surfaces, which may be a nuisance to residential properties and have various impacts on the natural environment.</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractor should implement good site practices which may include: <ul style="list-style-type: none"> <li>– Maintaining equipment in good running condition and in compliance with regulatory requirements;</li> <li>– Protecting stockpiles of soil with a barrier or windscreen in the event of dry conditions and excessive dust;</li> <li>– Dust suppression (e.g. water and/or calcium chloride) of</li> </ul> </li> </ul>	Any adverse net effects to air quality from dust emissions are anticipated to be short-term in duration and highly localized.

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	<ul style="list-style-type: none"> <li>No odour emissions are anticipated from the Project.</li> </ul>	<ul style="list-style-type: none"> <li>source areas; and; and</li> <li>– Covering loads during transport.</li> <li>An Environmental Management Plan would be developed by the Contractor that would include protocols for dust emission control.</li> </ul>	
Environmental Noise	<ul style="list-style-type: none"> <li>Noise would be generated by the operation of heavy equipment at each of the work areas and associated vehicular traffic on-site and on haul routes.</li> </ul>	<ul style="list-style-type: none"> <li>All engines associated with construction and decommissioning equipment would be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations.</li> <li>To the greatest extent possible, activities that could create excessive noise would be restricted to regular construction hours and adhere to any local noise by-laws. If activities that cause excessive noise must be carried out outside of these time frames, adjacent residents would be notified in advance and by-law conformity would occur, as required.</li> <li>Sources of continuous noise, such as portable generator sets, would be shielded as appropriate or located so as to minimize disturbance to local residents.</li> </ul>	Intermittent noise would increase during regular construction hours at the work areas and/or along the haul route. Any adverse net effects due to noise are anticipated to be short-term in duration and intermittent.
<b>Land Use and Socio-Economic Resources</b>			
Areas Protected Under Provincial Plans & Policies	<ul style="list-style-type: none"> <li>No areas protected under provincial plans and policies are located within 300 m of the Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	N/A
Existing Land Uses	<ul style="list-style-type: none"> <li>Agricultural lands where Project infrastructure is located would be changed from present land use for the duration of the Project.</li> <li>There would be a temporary increase in noise and dust levels around the work and haul areas resulting in a</li> </ul>	<ul style="list-style-type: none"> <li>Landowners would be compensated by St. Columban Energy LP for agricultural land that would be taken out of production during the lifespan of the Project through the land lease agreements.</li> <li>Mitigation measures related to noise from construction and decommissioning activities are outlined in '<i>Environmental Noise</i>'.</li> <li>Mitigation measures related to dust are outlined in '<i>Dust and Odour Emissions</i>'.</li> </ul>	Disturbance would be short-term in duration, temporary, and would be minimized through the implementation of good site practices, transportation planning, and communication with the community.

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	potential effects to adjacent land uses.		
Recreation Areas & Cultural Features	<ul style="list-style-type: none"> <li>Interference with nearby recreational uses (soccer fields and school facilities) from traffic, dust and noise.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures related to noise from construction and decommissioning activities are outlined in '<i>Environmental Noise</i>'.</li> <li>Mitigation measures related to dust are outlined in '<i>Dust and Odour Emissions</i>'.</li> <li>Mitigation measures related to construction and decommissioning traffic is outlined in '<i>Local Traffic</i>'.</li> </ul>	Any adverse effects are anticipated to be short term and intermittent.
Agricultural Lands and Operations	<ul style="list-style-type: none"> <li>Inconvenience to operations, including site-specific cropping patterns.</li> <li>Use of agricultural land for the facility components and temporary work areas, including use of areas of prime agricultural land.</li> <li>Potential impacts to soil.</li> <li>Adverse effects could occur to artificial drainage</li> <li>Potential for transportation of soybean cyst nematode (SCN) contaminated soil to non-infested fields.</li> <li>Impacts to livestock.</li> </ul>	<ul style="list-style-type: none"> <li>Detailed mitigation measures for impacts to agricultural lands and operations are provided in the <u>Construction Plan Report</u>. Key measures include: <ul style="list-style-type: none"> <li>Implementing a wet soil shutdown practice;</li> <li>Monitoring of topsoil stripping in areas to be restored after the construction/decommissioning activity;</li> <li>Decompaction to occur as required;</li> <li>Topsoil replacement;</li> <li>Artificial tile drainage would be repaired and monitored;</li> <li>Regular communication with property/livestock owners to ensure a minimum level of impact on livestock; and,</li> <li>In some areas, temporary fencing will be erected around workspaces.</li> </ul> </li> </ul>	Disturbances to agricultural lands and operations are expected to be temporary and spatially limited.
Mineral, Aggregate, and Petroleum Resources	<ul style="list-style-type: none"> <li>Lands designated for resource extraction are present within the Project Study Area.</li> <li>Project activities are not anticipated to have any potential effects on these resources</li> <li>No oil and gas pipelines and petroleum wells within 300 m of the Wind Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>Along the interconnection line, further discussions with the municipalities will identify the locations of deposits, and the details of any known plans to develop these resources.</li> </ul>	None



**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	Three wells are located within 300m of the Interconnection Line, but none are within 75m of infrastructure or construction.		
Game And Fishery Resources	<ul style="list-style-type: none"> <li>Sensory disturbance to game species may occur due to noise from construction and decommissioning activities.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures related to noise from construction and decommissioning activities are outlined in '<i>Environmental Noise</i>'.</li> </ul>	Construction and decommissioning noise is expected to be temporary and intermittent.
Local Traffic	<ul style="list-style-type: none"> <li>The increase in traffic, including excess load traffic, may result in short-term, localized disturbance to traffic patterns, increase in traffic volume, and create potential traffic safety hazards.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor would implement a Traffic Management Plan.</li> </ul>	Net effects of increased traffic and road safety are anticipated to be limited, short-term effects.
Local Economy	<ul style="list-style-type: none"> <li>Direct employment during construction.</li> <li>Indirect and induced employment.</li> </ul>	<ul style="list-style-type: none"> <li>Construction and decommissioning phases of the Project would provide positive economic benefits, therefore no mitigation measures are required.</li> <li>Disruptions in the vicinity of local businesses will be due to increase in traffic, and will be short term and not expected to affect use of these businesses.</li> </ul>	Traffic effects will be temporary, of short duration, and cease upon completion of the construction of the Project.
<b>Existing Infrastructure</b>			
Provincial and Municipal infrastructure	<ul style="list-style-type: none"> <li>The increase in traffic, including excess load traffic, may result in short-term, localized disturbance to traffic patterns, increase in traffic volume, create potential traffic safety hazards, and/or produce abnormal wear on the roads.</li> <li>There is the potential to interfere with local utilities.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor would implement a Traffic Management Plan.</li> <li>St. Columban Energy LP will undertake consultation with the MTO regarding any necessary agreements related to wear on roads from transportation of Project materials in addition to obtaining required permits for use of provincial highways.</li> <li>Any agreements between St. Columban Energy LP and the municipalities will be discussed during the consultation process.</li> </ul>	<p>Abnormal wear (e.g. rutting) on municipal roads during construction may be unavoidable.</p> <p>Net effects are anticipated to be limited and short-term.</p>

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
	<ul style="list-style-type: none"> <li>Transportation of excess loads and large turbine components may produce abnormal wear on the County roads.</li> </ul>		
Navigable Waters	<ul style="list-style-type: none"> <li>No navigable waters identified within 300 m of the Project Location.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	N/A
Utilities	<ul style="list-style-type: none"> <li>Potential damage during construction activities</li> </ul>	<ul style="list-style-type: none"> <li>In the event that any unidentified utilities are damaged during construction or decommissioning, St. Columban Energy LP will pay for repairs.</li> <li>Detailed plans or agreements regarding the use of road allowances for electrical collector lines will be developed with the Municipality and/or County.</li> </ul>	Net effects are anticipated to be limited and short-term.
<b>Waste Management and Contaminated Lands</b>			
Landfill Sites	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	N/A
Contaminated Lands	<ul style="list-style-type: none"> <li>There is potential for finding contaminated sites and improperly decommissioned oil and gas wells or pipelines.</li> </ul>	<ul style="list-style-type: none"> <li>In the event that previously unknown contaminated soils, such as buried tanks, drums, oil residue or gaseous odour, are uncovered or suspected of being uncovered, activities would cease in that location until the source of the contamination is further investigated.</li> <li>In such an instance, St. Columban Energy LP would seek expert advice on assessing and developing a soil sampling, handling and remediation plan. All contaminated material would be managed in accordance with the applicable sections of the <i>Environmental Protection Act</i> and Regulation 347.</li> </ul>	None
Waste Generation	<ul style="list-style-type: none"> <li>Improper disposal of waste material may result in contamination to soil, groundwater, and/or surface water resources on and off the Project sites. Litter may also become a nuisance to nearby residences if not appropriately contained and allowed to blow off the site.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor would implement a site-specific waste collection and disposal management plan, which may include site practices such as: <ul style="list-style-type: none"> <li>systematic collection and separation of waste materials;</li> <li>all waste materials and recycling would be transported off-site by private waste material collection contractors licensed with a Certificate of Approval – Waste Management System;</li> <li>contractors would be required to remove their excess materials from the site;</li> <li>excess materials generated during the course of construction</li> </ul> </li> </ul>	Minor incremental effect on soil, groundwater, and surface water at the waste disposal site(s) depending on municipal on-site containment practices and quality of the landfill protection mechanisms.

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		<p>excavations of soil would be handled in accordance with the MOE's Protocol for the Management of Excess Materials in Road Construction and Maintenance;</p> <ul style="list-style-type: none"> <li>– excess excavated soils may be reused elsewhere on the property with landowner permission;</li> <li>– labelling and proper storage of hazardous and liquid wastes (e.g. used oil, drained hydraulic fluid, and used solvents) in a secure area that would ensure containment of the material in the event of a spill;</li> <li>– dumping or burying wastes within the Project sites would be prohibited;</li> <li>– would contaminated soil be encountered during the course of excavations the contaminated material would be disposed of in accordance with the current appropriate provincial legislation, such as Ontario Regulation 347, the General – Waste Management Regulation;</li> <li>– disposal of non-hazardous waste at a registered waste disposal site(s);</li> <li>– if waste is classified as waste other than solid non-hazardous, a Generator Registration Number is required from the MOE and the generator would have obligations regarding manifesting of waste. Compliance with Schedule 4 of Regulation 347 is mandatory when determining waste category;</li> <li>– implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials; and</li> <li>– disposal of sanitary wastes would be the responsibility of the contracted third party and they would ensure disposal in accordance with appropriate legislation, standards and policies.</li> </ul> <ul style="list-style-type: none"> <li>• During construction, the cement provider would be responsible for ensuring that wash water from the cleaning of cement truck drums is disposed of in a sewage works designed for that purpose and approved under Section 53.(1) of the <i>Ontario Water Resources Act</i>,</li> </ul>	

**Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project**

**PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		or under Part 8 of the <i>Building Code Act</i> .	
Accidental Spills	<ul style="list-style-type: none"> <li>Some materials, such as fuel, lubricating oils and other fluids, have the potential for discharge to the on-site environment through accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>the Emergency Response Plan developed by the Contractor would include protocols for the proper handling of material spills and associated procedures in the event of a spill. Key measures include: <ul style="list-style-type: none"> <li>standard containment facilities and emergency response materials would be maintained on-site as required; and</li> <li>refuelling, equipment maintenance, and other potentially contaminating activities would occur in designated areas.</li> </ul> </li> <li>As appropriate spills would be reported immediately to the MOE Spills Action Centre.</li> </ul>	None
<b>Public Health and Safety</b>			
Public Health and Safety	<ul style="list-style-type: none"> <li>Potential effects to public health and safety are largely in the form of increased traffic, dust emissions, construction noise and unauthorized access of the public to the work sites.</li> </ul>	<ul style="list-style-type: none"> <li>A detailed Traffic Management Plan, Emergency Response and Communications Plan and Health and Safety Plan would be prepared and implemented by the Contractor.</li> <li>Mitigation measures related to the increased traffic is outlined in '<i>Local Traffic</i>'.</li> <li>Mitigation measures related to dust emissions is provided in '<i>Dust and Odour Emissions</i>'.</li> <li>Mitigation measures related to noise from construction and decommissioning activities are provided in '<i>Environmental Noise</i>'.</li> <li>Land access would be controlled through signage and restricted to authorized personnel only. The Health and Safety Plan would consider both public and occupational health and safety issues. This may include protecting the public from equipment and areas by posting warning signs, use of personal protective equipment, accident reporting, equipment operation, and confined space entry.</li> <li>Discussions will be undertaken, and would continue, with local emergency services personnel. St. Columban Energy LP would participate in a training session for these workers.</li> </ul>	There is minimal increased or new risk to public health and safety from construction and/or decommissioning of the Project.

**Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project**

**PROJECT PHASE: OPERATION**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
<b><i>Heritage and Archaeological Resources</i></b>			
Protected Properties and Heritage Resources	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Archaeological Resources	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<b><i>Natural Heritage Resources</i></b>			
Wetlands	<ul style="list-style-type: none"> <li>• Contamination through accidental spills.</li> <li>• Disturbance due to increased traffic, noise or dust during operations and maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures related to accidental spills are outlined in '<i>Accidental Spills</i>'.</li> <li>• Mitigation measures related to dust emissions are outlined in '<i>Dust and Odour Emissions</i>'.</li> <li>• Further wetland mitigation measures can be found in the NHA/EIS.</li> </ul>	<ul style="list-style-type: none"> <li>• Impacts from increased traffic, noise or dust are anticipated to be temporary in duration and relatively minor in scale.</li> <li>• Accidental spills would be spatially limited and of short duration and protocols to minimize their impact would be provided in the Emergency Response Plan.</li> <li>• Setback distances from wetlands will ensure that there is no disruption of wetland function and no net loss of wetland area.</li> </ul>
Areas of Natural and Scientific Interest	<ul style="list-style-type: none"> <li>• Contamination through accidental spills.</li> <li>• Dust emissions during operation and maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures related to accidental spills are outlined in '<i>Accidental Spills</i>'.</li> <li>• Mitigation measures related to dust emissions are outlined in '<i>Dust and Odour Emissions</i>'.</li> </ul>	<ul style="list-style-type: none"> <li>• Accidental spills would be spatially limited and short-term in duration and protocols to minimize their impact would be provided in the Emergency Response Plan.</li> <li>• Indirect impacts are expected to be short-term in duration and highly localized.</li> </ul>
Valleylands and Hazard Lands	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Significant Woodlands	<ul style="list-style-type: none"> <li>• Contamination through accidental spills.</li> <li>• Dust emissions during operation and maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures related to accidental spills are outlined in '<i>Accidental Spills</i>'.</li> <li>• Mitigation measures related to dust emissions are outlined in '<i>Dust and Odour Emissions</i>'.</li> </ul>	<ul style="list-style-type: none"> <li>• Accidental spills would be spatially limited and short-term in duration and protocols to minimize their impact would be provided in the Emergency Response Plan.</li> <li>• Indirect impacts are expected to be short-</li> </ul>

**Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project**

**PROJECT PHASE: OPERATION**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
			term in duration and highly localized.
Provincial Parks and Conservation Reserves	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Other Designated Natural Areas	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Significant Wildlife and Wildlife Habitat ( <i>Amphibian Breeding and Winter Deer Yard</i> )	<ul style="list-style-type: none"> <li>• Contamination through accidental spills.</li> <li>• Disturbance due to increased traffic, noise or dust during operations and maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures related to accidental spills are outlined in '<i>Accidental Spills</i>'.</li> <li>• Mitigation measures for dust are outlined in '<i>Dust and Odour Emissions</i>'.</li> <li>• Mitigation measures for noise are outlined in '<i>Environmental Noise</i>'.</li> </ul>	<ul style="list-style-type: none"> <li>• Accidental spills would be spatially limited and of short duration and protocols to minimize their impact would be provided in the Emergency Response Plan.</li> <li>• Impacts from increased traffic, noise or dust are anticipated to be temporary in duration and relatively minor in scale.</li> <li>• Setback distances from amphibian breeding habitat will ensure that there is no net loss of amphibian breeding habitat.</li> </ul>
Other Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> <li>• Disturbance and direct mortality to forest and grassland breeding species</li> <li>• Potential for noise, disturbance and limited mortality due to bird and bat collisions with turbines.</li> </ul>	<ul style="list-style-type: none"> <li>• See '<i>Significant Wildlife and Wildlife Habitat</i>', '<i>Local Traffic</i>' and '<i>Environmental Noise</i>'</li> </ul>	<ul style="list-style-type: none"> <li>• May be limited disturbance and mortality.</li> </ul>
Significant Flora and Vegetation Communities	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Other Flora and Vegetation Communities	<ul style="list-style-type: none"> <li>• Disturbance to other flora and vegetation from dust emissions.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures related to dust emissions are outlined in '<i>Dust and Odour Emissions</i>'.</li> </ul>	<ul style="list-style-type: none"> <li>• Net effects would be short-term in duration and spatially limited.</li> </ul>
Birds	<ul style="list-style-type: none"> <li>• Direct mortality.</li> </ul>	<ul style="list-style-type: none"> <li>• Mortality thresholds.</li> </ul>	<ul style="list-style-type: none"> <li>• May be limited mortality.</li> </ul>

**Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project**

**PROJECT PHASE: OPERATION**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
Bats	<ul style="list-style-type: none"> <li>• Direct mortality.</li> </ul>	<ul style="list-style-type: none"> <li>• Mortality thresholds.</li> </ul>	<ul style="list-style-type: none"> <li>• May be limited mortality.</li> </ul>
<b>Water Bodies and Aquatic Resources</b>			
Groundwater	<ul style="list-style-type: none"> <li>• Potential contamination from accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures related to accidental spills are outlined in ‘<i>Accidental Spills</i>’.</li> </ul>	<ul style="list-style-type: none"> <li>• Accidental spills would be spatially limited and of short duration and protocols to minimize their impact would be provided in the Emergency Response Plan.</li> </ul>
Surface Water, Fish and Fish Habitat	<ul style="list-style-type: none"> <li>• Potential contamination from accidental spills.</li> <li>• Erosion and sedimentation</li> </ul>	<ul style="list-style-type: none"> <li>• Following completion of the maintenance activity, stream banks will be restored to original grade and seeding will be completed during favourable climatic conditions.</li> <li>• If siltation to a watercourse occurs, activities will cease immediately until siltation is rectified.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal net effects are anticipated to be spatially and temporarily limited.</li> </ul>
<b>Air Quality and Environmental Noise</b>			
Air Emissions	<ul style="list-style-type: none"> <li>• Emissions from operation and maintenance activities, including equipment and vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>• Operations staff would operate vehicles in a manner that reduces air emissions to the extent practical, including: <ul style="list-style-type: none"> <li>– Using multi-passenger vehicles as possible</li> <li>– Avoid idling vehicles.</li> </ul> </li> <li>• Equipment and vehicles would be maintained in a manner that reduces air emissions, including: <ul style="list-style-type: none"> <li>– Using mufflers and emission control systems as available;</li> <li>– Using catalytic converters as required;</li> <li>– Meet the emissions requirements of the Ministry of the Environment (MOE) and/or Ministry of Transportation (MTO);</li> <li>– As appropriate, records of vehicle maintenance should be retained and made available for periodic review by the Contractor; and</li> <li>– All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Increased emissions would be short-term in duration and highly localized.</li> </ul>

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**PROJECT PHASE: OPERATION**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
		replaced as soon as practicable.	
Dust and Odour Emissions	<ul style="list-style-type: none"> <li>• Dust emissions from operation and maintenance vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintaining equipment in good running condition and in compliance with regulatory requirements.</li> <li>• Dust suppression (e.g. water and/or calcium chloride) of source areas as necessary.</li> <li>• Covering loads of friable materials during transport.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased dust would be short-term in duration and highly localized.</li> </ul>
Environmental Noise	<ul style="list-style-type: none"> <li>• Noise emitted from a turbine and/or transformer.</li> <li>• Noise emitted from traffic and/or vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>• Adherence to all noise setback requirements.</li> <li>• All engines associated with maintenance equipment would be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations.</li> <li>• Noise levels arising from maintenance equipment would also be compliant with sound levels established by the MOE.</li> <li>• Routine Project maintenance to ensure infrastructure is operating properly and efficiently.</li> <li>• To the greatest extent possible, operations activities that could create excessive noise would be restricted to regular business hours, when residents are less sensitive to noise, and adhere to any local noise by-laws.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise is anticipated to be short-term in duration and intermittent.</li> </ul>
<b>Land Use and Socio-Economic Resources</b>			
Existing Land Uses	<ul style="list-style-type: none"> <li>• Lands which are occupied by facility components would be removed from their present land-use.</li> <li>• Temporary increase in noise and dust levels.</li> <li>• Potential for minor increase of traffic during maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Landowners will be compensated by St. Columban Energy LP for agricultural land that will be taken out of production during the lifespan of the Project through the land lease agreements.</li> <li>• Mitigation measures related to noise are outlined in 'Environmental Noise'</li> <li>• Mitigation measures related to dust emissions are outlined in 'Dust and Odour Emissions'.</li> <li>• Mitigation measures related to traffic are outlined in 'Local Traffic'.</li> </ul>	<ul style="list-style-type: none"> <li>• Disturbance is anticipated to be short-term in duration, temporary, highly localized, and minimized through good site practices, transportation planning and communication with the community.</li> </ul>



**Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project**
**PROJECT PHASE: OPERATION**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
Recreation Areas and Cultural Features	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Agricultural Lands and Operations	<ul style="list-style-type: none"> <li>• Inconvenience to operations from traffic and dust.</li> <li>• Minimal impacts to livestock anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>• Activities would be restricted to the delineated Project areas such as access roads and crane pads.</li> <li>• Mitigation measures related to dust emissions are outlined in '<i>Dust and Odour Emissions</i>'.</li> <li>• Mitigation measures related to traffic are outlined in '<i>Local Traffic</i>'.</li> <li>• Communication with livestock owners.</li> </ul>	<ul style="list-style-type: none"> <li>• Effects to be temporary and spatially limited.</li> </ul>
Mineral, Aggregate, and Petroleum Resources	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Game And Fishery Resources	<ul style="list-style-type: none"> <li>• Disturbance to game species from noise.</li> <li>• Improperly installed culverts have potential to affect fish habitat and may impose barriers to fish passage.</li> </ul>	<ul style="list-style-type: none"> <li>• Turbines would be placed in agricultural lands away from woodlands, and within the REA setback requirements.</li> <li>• Culverts would be designed and installed such that there is no restriction of flows through the culvert.</li> </ul>	<ul style="list-style-type: none"> <li>• Adverse net effects are anticipated to be short-term in duration and intermittent.</li> </ul>
Local Traffic	<ul style="list-style-type: none"> <li>• Increase in traffic may result in short-term, localized disturbance to traffic patterns or increases in traffic volumes, and/or create potential traffic safety hazards.</li> </ul>	<ul style="list-style-type: none"> <li>• There may be instances where excess loads (e.g. turbine and transformer components) would require special traffic planning, widening turning radii and road widths and the creation of new ingress/egress nodes.</li> </ul>	<ul style="list-style-type: none"> <li>• Any adverse effects would be short-term and intermittent.</li> </ul>
Viewscape	<ul style="list-style-type: none"> <li>• Disruption to the local viewscape from siting of project infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• To minimize visual impact of the turbines they will be painted light grey, and spread out over the Project Study Area.</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure would be present during the life of the Project.</li> </ul>
Local Economy	<ul style="list-style-type: none"> <li>• Increase in direct, indirect and induced employment over the operations period.</li> <li>• Local economic benefits from</li> </ul>	<ul style="list-style-type: none"> <li>• The operation of the Project would provide positive economic benefits, therefore no mitigation measures are required.</li> </ul>	<ul style="list-style-type: none"> <li>• Positive.</li> </ul>

**Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project**
**PROJECT PHASE: OPERATION**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	land lease payments, municipal taxes, etc.		
<b>Existing Infrastructure</b>			
Provincial, municipal, and other major infrastructure	<ul style="list-style-type: none"> <li>May be instances during maintenance activities where excess loads would require special traffic planning. Permits from the MTO may be required.</li> </ul>	<ul style="list-style-type: none"> <li>Necessary permits would be obtained.</li> <li>As appropriate, for public safety all non-conventional loads would have front and rear escort or “pilot” vehicles accompany the truck movement on public roads.</li> <li>Consultation with the Municipality and County regarding excess loads with potential to damage roads.</li> </ul>	<ul style="list-style-type: none"> <li>No net effects are anticipated to provincial and local infrastructure during operation of the Project.</li> <li>Any adverse effects would be short-term in duration and intermittent.</li> </ul>
Navigable Waters	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Telecommunication or Radar Systems	<ul style="list-style-type: none"> <li>Potential to interfere with radio, internet or TV signals.</li> </ul>	<ul style="list-style-type: none"> <li>St. Columban Energy LP has consulted with relevant agencies and licensed providers to identify any likely effects to telecommunication and radar systems.</li> <li>In the unlikely event that signal disruption is experienced, mitigation measures may include: <ul style="list-style-type: none"> <li>Replacing the receiving antenna with one that has a better discrimination to the unwanted signals;</li> <li>Relocating either the transmitter or receiver; or</li> <li>Switching to an alternate means of receiving the information.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Any adverse effects would be limited and of short-duration.</li> </ul>
Aeronautical Systems	<ul style="list-style-type: none"> <li>Aeronautical obstruction.</li> </ul>	<ul style="list-style-type: none"> <li>Turbine lighting must conform to Transport Canada standards.</li> <li>In order to reduce rural light pollution, lights would be selected with the minimal allowable flash duration, narrow beam, and would be synchronized.</li> <li>NAV CANADA would update all aeronautical charts with the turbine locations promptly after Project approval.</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Waste Management and Contaminated Lands</b>			
Waste Generation	<ul style="list-style-type: none"> <li>Improper disposal of waste material generated may result in contamination to soil,</li> </ul>	<ul style="list-style-type: none"> <li>Contractors would be required to remove all waste materials from the turbine siting areas during maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>Minor incremental effect on soil, groundwater, and surface water at the waste disposal site(s) depending on</li> </ul>

**Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project**

**PROJECT PHASE: OPERATION**

<b>Environmental Feature</b>	<b>Potential Adverse Effects</b>	<b>Mitigation Strategy</b>	<b>Net Effects</b>
	<p>groundwater, and/or surface water resources on and off the Project sites.</p> <ul style="list-style-type: none"> <li>Litter generated may also become a nuisance to nearby residences if not appropriately contained and allowed to blow off the site.</li> </ul>	<ul style="list-style-type: none"> <li>All waste materials and recycling would be transported off-site by private waste material collection contractors licensed with a Certificate of Approval – Waste Management System.</li> <li>Labelling and proper storage of liquid wastes (e.g. used oil, drained hydraulic fluid, and used solvents) in a secure area that would ensure containment of the material in the event of a spill.</li> <li>As per s.13 of the <i>Environmental Protection Act</i>, all spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of the prescribed regulatory levels would be reported to the MOE's Spills Action Centre;</li> <li>As appropriate, spill kits (e.g. containing absorbent cloths and disposal containers) would be provided on-site during maintenance activities and at the operation and maintenance building.</li> <li>Dumping or burying wastes within the Project sites would be prohibited.</li> <li>Disposal of non-hazardous waste at a registered waste disposal site(s).</li> <li>If waste is classified as waste other than solid non-hazardous, a Generator Registration Number is required from the MOE and the generator would have obligations regarding manifesting of waste.</li> <li>Implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials.</li> </ul>	<p>municipal on-site containment practices.</p>
Accidental Spills	<ul style="list-style-type: none"> <li>Some materials, such as fuel, lubricating oils and other fluids, have the potential for discharge to the on-site environment through accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>Standard containment facilities and emergency response materials would be maintained on-site as required.</li> <li>Refuelling, equipment maintenance, and other potentially contaminating activities would occur in designated areas.</li> <li>Spills should be reported immediately to the MOE Spills</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>

**Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project**
**PROJECT PHASE: OPERATION**

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		Action Centre, as appropriate.	
<b>Public Health and Safety</b>			
Turbine Blade and Structural Failure	<ul style="list-style-type: none"> <li>• Collapse of turbine tower, and/or blade detachment.</li> </ul>	<ul style="list-style-type: none"> <li>• Turbines must meet strict international engineering standards.</li> <li>• Proper training and education of staff operating the control system.</li> <li>• Adherence to setbacks from receptors.</li> <li>• Design, install, operate, and maintain turbines according to applicable industry standards/certifications.</li> <li>• Use of lightning protection systems.</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
Ice fall and Shed	<ul style="list-style-type: none"> <li>• Accumulation of ice on turbine blades.</li> </ul>	<ul style="list-style-type: none"> <li>• Adherence to setback from receptors.</li> <li>• Design of turbine tower reduces ice accumulation.</li> <li>• Automatic turbine shutdown due to weight imbalances.</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
Extreme Weather Events	<ul style="list-style-type: none"> <li>• Potential damage to project infrastructure from extreme weather events.</li> </ul>	<ul style="list-style-type: none"> <li>• Design, install, operate, and maintain turbines according to applicable industry standards/certifications.</li> <li>• Failsafe devices are capable of shutting down the turbine blades in the event of excessive wind conditions, imbalance, or malfunction of other turbine components.</li> <li>• Project components have been designed to withstand the effects from extreme events.</li> <li>• Adherence to setbacks from receptors.</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
Third Party Damage	<ul style="list-style-type: none"> <li>• Possibility exists for accidental collision from off-road and maintenance vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>• Access to towers will be restricted to avoid potential accidents to unqualified persons.</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>

**Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project**

Environmental Feature	Construction	Operation	Decommissioning
<b>Heritage and Archaeological Resources</b>			
Protected Properties and Heritage Resources	• N/A	• N/A	• N/A
Archaeological Resources	• Monitoring would be required following the unlikely event of the discovery of previously unknown archaeological resources, in consultation with the Ministry of Tourism and Culture.	• N/A	• N/A
<b>Natural Heritage Resources</b>			
Wetlands	• Vegetation clearing activities would be conducted under constant observation and monitoring of the Construction Contractor to ensure that vegetation is cleared only from designated areas. Areas outside the designated construction-sites would not be disturbed.	• See 'Accidental Spills' • See 'Dust and Odour Emissions'	• Follow-up monitoring for one year after site restoration would be conducted, to allow for the Project area to experience seasonal changes and help determine if additional restoration is required, as determined by an environmental advisor.  • A monitoring plan would be prepared prior to decommissioning.
Areas of Natural and Scientific Interest		• See 'Accidental Spills' • See 'Dust and Odour Emissions'	
Valleylands and Hazard Lands		• N/A	
Woodlands		• See 'Accidental Spills' • See 'Dust and Odour Emissions'	
Provincial Parks and Conservation Reserves		• N/A	
Other Designated Natural Areas		• N/A	
Significant Wildlife and Wildlife Habitat ( <i>Significant Wildlife</i> )		• Post-construction disturbance and mortality monitoring will be conducted to verify effects predictions and additional operational mitigation will be implemented if unanticipated effects occur. • Environmental Effects Monitoring Plan submitted as part of the REA application would include: – Bird and bat mortality monitoring at 5 turbines (i.e. at least 30% of turbines) twice-weekly from May 1 to October 31, and once-weekly for raptors from November 1-30, for a period of three	

**Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project**

Environmental Feature	Construction	Operation	Decommissioning
		<ul style="list-style-type: none"><li>years.</li><li>Regular reporting that includes analysis and submission of results to MNR.</li></ul>	
Significant Wildlife and Wildlife Habitat ( <i>Amphibian Breeding and Deer Yards</i> )		<ul style="list-style-type: none"><li>See '<i>Accidental Spills</i>'</li><li>See '<i>Dust and Odour Emissions</i>'</li></ul>	
Significant Wildlife and Wildlife Habitat ( <i>Area Sensitive Species and Declining Species</i> )		<ul style="list-style-type: none"><li>N/A</li></ul>	
Other Wildlife and Wildlife Habitat		<ul style="list-style-type: none"><li>See '<i>Local Traffic</i>'</li><li>See '<i>Environmental Noise</i>'</li><li>Post-construction disturbance and mortality monitoring will be conducted to verify effects predictions and additional operational mitigation will be implemented if unanticipated effects occur.</li><li>See '<i>Accidental Spills</i>'</li><li>See '<i>Dust and Odour Emissions</i>'</li></ul>	
Significant Flora and Vegetation Communities		<ul style="list-style-type: none"><li>N/A</li></ul>	
Other Flora and Vegetation Communities		<ul style="list-style-type: none"><li>See '<i>Dust and Odour Emissions</i>'</li></ul>	
Birds		<ul style="list-style-type: none"><li>See '<i>Significant Wildlife and Wildlife Habitat (Significant Wildlife)</i>'</li></ul>	
Bats		<ul style="list-style-type: none"><li>See '<i>Significant Wildlife and Wildlife Habitat (Significant Wildlife)</i>'</li></ul>	
Water Bodies and Aquatic Resources			
Groundwater	<ul style="list-style-type: none"><li>In the event that turbines are located within 99.5 m of private residential wells of participating landowners, the Construction Contractor may, at the landowner's request, monitor the quality and quantity of the well over</li></ul>	<ul style="list-style-type: none"><li>See '<i>Accidental Spills</i>'</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>

**Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project**

Environmental Feature	Construction	Operation	Decommissioning
	<p>the course of construction. The hydrogeologist will develop a well monitoring program to address potentially affected wells.</p> <ul style="list-style-type: none"> <li>• In the event that well water quality or quantity is disturbed as a result of construction, St. Columban Energy LP would provide a temporary potable water supply until corrective measures are taken and would comply with MOE's Guideline B-9: Resolution of Groundwater Interference Problems. All corrective measures, including determination of when corrective measures are no longer required, would be outlined in the well monitoring program.</li> </ul>		
Surface Water, Fish and Fish Habitat	<ul style="list-style-type: none"> <li>• The Construction Contractor will monitor weather forecasts prior to the installation of access roads, crane paths and collector lines, particularly prior to work near aquatic habitats.</li> <li>• Environmental monitoring following spring run-off the year after construction may also be considered to review the effectiveness of the bank and slope revegetation (if required), to check bank and slope stability, and to ensure surface drainage has been maintained.</li> <li>• Appropriate remedial measures will be completed as necessary and additional follow-up monitoring conducted as appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>• See 'Accidental Spills'</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

**Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project**

Environmental Feature	Construction	Operation	Decommissioning
<b><i>Air Quality and Environmental Noise</i></b>			
Air Quality	<ul style="list-style-type: none"> <li>As appropriate, records of vehicle maintenance would be retained and made available for periodic review by the Construction Contractor.</li> <li>All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practicable from the construction area.</li> </ul>	<ul style="list-style-type: none"> <li>None required.</li> </ul>	<ul style="list-style-type: none"> <li>As appropriate, records of vehicle maintenance would be retained and made available for periodic review by the Contractor. All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practicable from the decommissioning area.</li> </ul>
Dust and Odour Emissions	<ul style="list-style-type: none"> <li>The Contractor would monitor to ensure that temporary topsoil storage piles are stabilized with appropriate means.</li> </ul>	<ul style="list-style-type: none"> <li>Adherence to Complaint Response Protocol.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor would monitor to ensure that temporary topsoil storage piles are stabilized with appropriate means.</li> </ul>
Environmental Noise	<ul style="list-style-type: none"> <li>Monitoring and maintenance of noise abatement devices on construction and support equipment would also take place to keep noise levels within acceptable construction noise standards.</li> <li>All vehicles identified through the monitoring program that fail to meet the minimum noise standards will be repaired immediately or replaced as soon as practicable from the construction area.</li> </ul>	<ul style="list-style-type: none"> <li>Noise monitoring (if required), would be conducted in accordance with the REA for the Project.</li> <li>Turbine shutdown in the event of a malfunctioning turbine or extreme weather event.</li> <li>Turbine maintenance to ensure turbines are running properly and efficiently.</li> <li>Adherence to Complaint Response Protocol.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b><i>Land Use and Socio-Economic Resources</i></b>			
Areas Protected Under Provincial Plans & Policies	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Existing Land Uses	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>See 'Environmental Noise'.</li> <li>See 'Dust and Odour Emissions'.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Recreation Areas & Cultural	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>



**Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project**

Environmental Feature	Construction	Operation	Decommissioning
Features			
Agricultural Lands and Operations	<ul style="list-style-type: none"> <li>For a period of one year after restoration of temporary work areas on agricultural lands, potential soil problem areas including subsidence, soil erosion and/or stoniness would be visually monitored by a soil specialist (such as a professional agrologist), or as per agreements with the landowner.</li> <li>If adverse impacts are noted during monitoring, appropriate remediation measures would be developed by the soil specialist, or as per agreements with the landowner. Additional follow-up monitoring would be conducted, under supervision of the soils specialist, until adverse impacts are no longer evident.</li> </ul>	<ul style="list-style-type: none"> <li>Adherence to Complaint Response Protocol.</li> </ul>	<ul style="list-style-type: none"> <li>For agricultural land, potential soil problem areas including trench subsidence, soil erosion and/or stoniness would be noted.</li> <li>Additional monitoring activities may also be conducted, depending upon the site conditions at the time of decommissioning. If negative impacts are noted during monitoring activities, appropriate remediation measures would be implemented as necessary, and additional follow-up monitoring would be conducted, as determined by an environmental advisor.</li> </ul>
Mineral, Aggregate, and Petroleum Resources	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Game And Fishery Resources	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>See 'Environmental Noise'</li> <li>None required.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Local Traffic	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Adherence to Complaint Response Protocol.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Viewscape	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Adherence to Complaint Response Protocol.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
Local Economy	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>None required.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>Existing Infrastructure</b>			
Provincial and other major infrastructure	<ul style="list-style-type: none"> <li>See 'Municipal infrastructure'.</li> </ul>	<ul style="list-style-type: none"> <li>See 'Local Traffic'.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Navigable Waters	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Municipal infrastructure	<ul style="list-style-type: none"> <li>For a period of one year after construction (first year of operations),</li> </ul>	<ul style="list-style-type: none"> <li>See 'Local Traffic'</li> </ul>	<ul style="list-style-type: none"> <li>For municipal road allowances, a review should occur of the</li> </ul>

**Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project**

Environmental Feature	Construction	Operation	Decommissioning
	<p>roads would be monitored following a heavy rain event and following spring runoff, as defined by applicable agreements, to ensure no erosion, bank slumpage, road subsidence or major rutting has occurred as a result of construction activities. As appropriate, affected roadside ditches and drains would be repaired if required and monitored to ensure that they are functioning properly.</p> <ul style="list-style-type: none"> <li>• If adverse impacts are noted during the above post-construction monitoring, appropriate remediation measures would be developed as per applicable agreements. As appropriate, affected road substrate would be repaired and roadside ditches and drains would be revegetated. Additional follow-up monitoring would be conducted, as per applicable agreements, until adverse impacts are no longer evident.</li> </ul>		<p>establishment and health of revegetation. Additional monitoring activities may also be conducted, depending upon the site conditions at the time of decommissioning. If negative impacts are noted during monitoring activities, appropriate remediation measures would be implemented as necessary, and additional follow-up monitoring would be conducted, as determined by an environmental advisor.</p>
Telecommunication and Radar Systems	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• Adherence to Complaint Response Protocol.</li> <li>• St. Columban Energy LP would review potential incidents of telecommunication and radar system interference on a case by case basis.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Aeronautical Systems	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• On-going consultation is occurring with NAV CANADA regarding potential impacts and mitigation measures related to interference with air traffic.</li> <li>• Routine maintenance of the turbines and replacement of safety lighting in the event</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

**Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project**

Environmental Feature	Construction	Operation	Decommissioning
		of malfunction.	
<b>Waste Management and Contaminated Lands</b>			
Landfill Sites	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>None required.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Contaminated Lands	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>See 'Accidental Spills'</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Waste Generation	<ul style="list-style-type: none"> <li>As appropriate, records of waste generation and hauling would be maintained. Where a third party's activities are identified as non-compliant or insufficient, the Construction Contractor would seek out an alternative recycling or disposal solution.</li> <li>Stringent monitoring of waste disposal to ensure terrestrial flora and fauna are protected.</li> </ul>	<ul style="list-style-type: none"> <li>See 'Accidental Spills'</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Accidental Spills	<ul style="list-style-type: none"> <li>Stringent monitoring of accidental spills and/or leaks to ensure terrestrial flora and fauna are protected.</li> <li>Monitoring would be required following the unlikely event of contamination from an accidental spill or leak. Contaminated soils would be removed and replaced as appropriate. All such activities would follow procedures outlined in the Emergency Response Plan for the CEMP.</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring would be required following the unlikely event of contamination from an accidental spill or leak (method for monitoring may be developed in consultation with the Spills Action Centre of the MOE).</li> <li>Contaminated soils would be removed and replaced as appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>Public Health and Safety</b>			
Turbine blade and Structural failure	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Inspections of turbines would occur after extreme events and contingency measures such as turbine shutdown would be implemented in the event of structural damage.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

**Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project**

<b>Environmental Feature</b>	<b>Construction</b>	<b>Operation</b>	<b>Decommissioning</b>
		<ul style="list-style-type: none"> <li>• Turbine maintenance to ensure turbines are running properly and efficiently</li> </ul>	
Ice fall and shed	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• Inspections of turbines would occur after extreme events and contingency measures such as turbine shutdown would be implemented in the event of structural damage and/or icing to a turbine(s).</li> <li>• Turbine maintenance to ensure turbines are running properly and efficiently.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Extreme Weather Events	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• See 'Turbine blade and Structural failure'.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Third Party Damage	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• See 'Turbine blade and Structural failure'.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

## **Appendix C**

### **Legal Description of Project Land Parcels**

## Appendix C - Legal Description of Land Parcels

<b>Turbine ID</b>	<b>TOWNSHIP</b>	<b>CONCESSION</b>	<b>LOT NUMBER</b>
1	MCKILLOP	CON 2	LOT 6
2	MCKILLOP	CON 2	LOT 6
3	MCKILLOP	CON 3	LOT 7
4	MCKILLOP	CON 4	LOT 7
5	MCKILLOP	CON 5	LOT 7
6	MCKILLOP	CON 5	LOT 14
7	MCKILLOP	CON 5	LOT 11
8	MCKILLOP	CON 5	LOT 9
9	MCKILLOP	CON 7	LOT 10
10	MCKILLOP	CON 7	LOT 11
11	MCKILLOP	CON 1	LOT 11
12	MCKILLOP	CON 2	LOT 11
13	MCKILLOP	CON 2	LOT 10
14	MCKILLOP	CON 2	LOT 9
15	MCKILLOP	CON 4	LOT 3
transformer station	HOWICK	CON A	WEST HALF LT 31