ADELAIDE WIND ENERGY CENTRE

RENEWABLE ENERGY APPROVAL APPLICATION

PROJECT DESCRIPTION REPORT

AUGUST 2012

GL Garrad Hassan

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ADELAIDE WIND ENERGY CENTRE, ONTARIO

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Contact	Ben Greenhouse
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REVISION HISTORY

Issue	Issue Date	Summary
A	14 October 2011	Initial version
B	1 February 2012	Updated to include Environmental Effects Monitoring Plan
C	21 February 2012	Final client revisions
D	23 April 2012	Update Environmental Effects Monitoring Plan
E	15 August 2012	Addition of Appendix B, Legal Description

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1 PREAMBLE

Kerwood Wind, Inc. is proposing to develop the Adelaide Wind Energy Centre (the "Project") which is subject to Ontario Regulation 359/09 (Renewable Energy Approvals (REA) [1] under Part V.0.1 of the Ontario Environmental Protection Act (EPA)) and Regulation 521/10 [2]. Kerwood Wind, Inc. was awarded a Feed-in-Tariff (FIT) Contract for this Project in July 2011 and is seeking a Renewable Energy Approval from the Ontario Ministry of the Environment (MOE). Kerwood Wind, Inc. is a wholly-owned subsidiary of NextEra Energy Canada, ULC (NextEra). The parent company of NextEra Energy Canada, ULC is NextEra Energy Resources, LLC, with a current portfolio of over 8,800 operating wind turbines across North America.

An ESR/EIS for the Project was previously submitted to the MOE in June 2009 by Air Energy TCI Inc. (AET), the North American subsidiary of TCI Renewables Ltd. The name of the Project at the time of the June 2009 submission was the Adelaide Wind Farm. The TCI project was subsequently purchased and transferred to Kerwood Wind Inc.; however, TCI has remained engaged in the project development.

This Project is considered to be a Class 4 Wind Facility. The Project is located in the Township of Adelaide-Metcalfe and North Middlesex and is proposed to consist of 37, 1.62 MW turbines with a total nameplate capacity of up to 59.9 MW, though 38 turbine positions will be permitted.

This Project Description Report has been prepared in accordance with section 54.1 of O. Reg. 359/09 and the MOE's "Technical Guide to Renewable Energy Approvals"(2011) [3].

1.1 General Project Description

The proposed Project Study Area comprises two main sectors, the Wind Energy Centre Study Area, which contains the wind farm itself, and its associated infrastructure, and the Transmission Line Study Area. Within the transmission line study area, Kerwood wind Inc. is proposing a 115 kV transmission line to run from the Project's substation on to a switchyard and then on to a second substation (Parkhill substation) where it will be transferred to a Hydro One-owned switchyard and on to Hydro One's 500 kV transmission line at the east end of the Transmission Line Study Area. It is important to note that the 115 kV line running from the switchyard to the Parkhill substation then to the Hydro One-owned switchyard on to Hydro One's existing 500 kV line is common to three of NextEra's Projects, i.e. Adelaide, Bornish and Jericho Wind Energy Centres.

The Wind Energy Centre Study Area is located in south-western Ontario, in the Township of Adelaide-Metcalfe, Middlesex County, Ontario. More specifically, the wind farm components are located south of Townsend Line, west of Centre Road, north of Napperton Drive and east of Sexton Road. The total Wind Energy Centre Study Area is approximately 6,515 ha. Project components will be installed on privately-owned agricultural lots within this area, though the Project's collection system will be partially located on public rights-of-way. General geographic coordinates of the Wind Energy Centre Study Area are presented in Table 1-1.

Table 1-1: Geographic coordinates of the Wind Energy Centre Study Area

Site	Easting	Northing
Northwest corner	436378	4767049
Northeast corner	447998	4767049
Southwest corner	447998	4756197
Southeast corner	436378	4756197

The Project also comprises a proposed transmission route which is located to the north of the Wind Energy Centre Study Area and crosses into the Municipality of North Middlesex. The proposed transmission route is to travel north from the Project substation using the existing right-of-way along Kerwood Road to a switchyard located just south of Elginfield Road. From there the transmission route is proposed to run east along Elginfield and Nairn Roads within municipal rights-of-way to a second, Parkhill, substation then to a Hydro one-owned switchyard on to an existing Hydro One 500 kV transmission line. General natural heritage information in the vicinity of the transmission line route is provided in the Natural Heritage Assessment reports, which are submitted as part of the complete REA application package.

The location of the Wind Energy Centre Study Area was defined early in the planning process for the proposed wind energy facility, based on the wind resource, approximate area required for the proposed Project, and availability of existing infrastructure for connection to the electrical grid. The Project Study Area was used to facilitate information collection and Records Review.

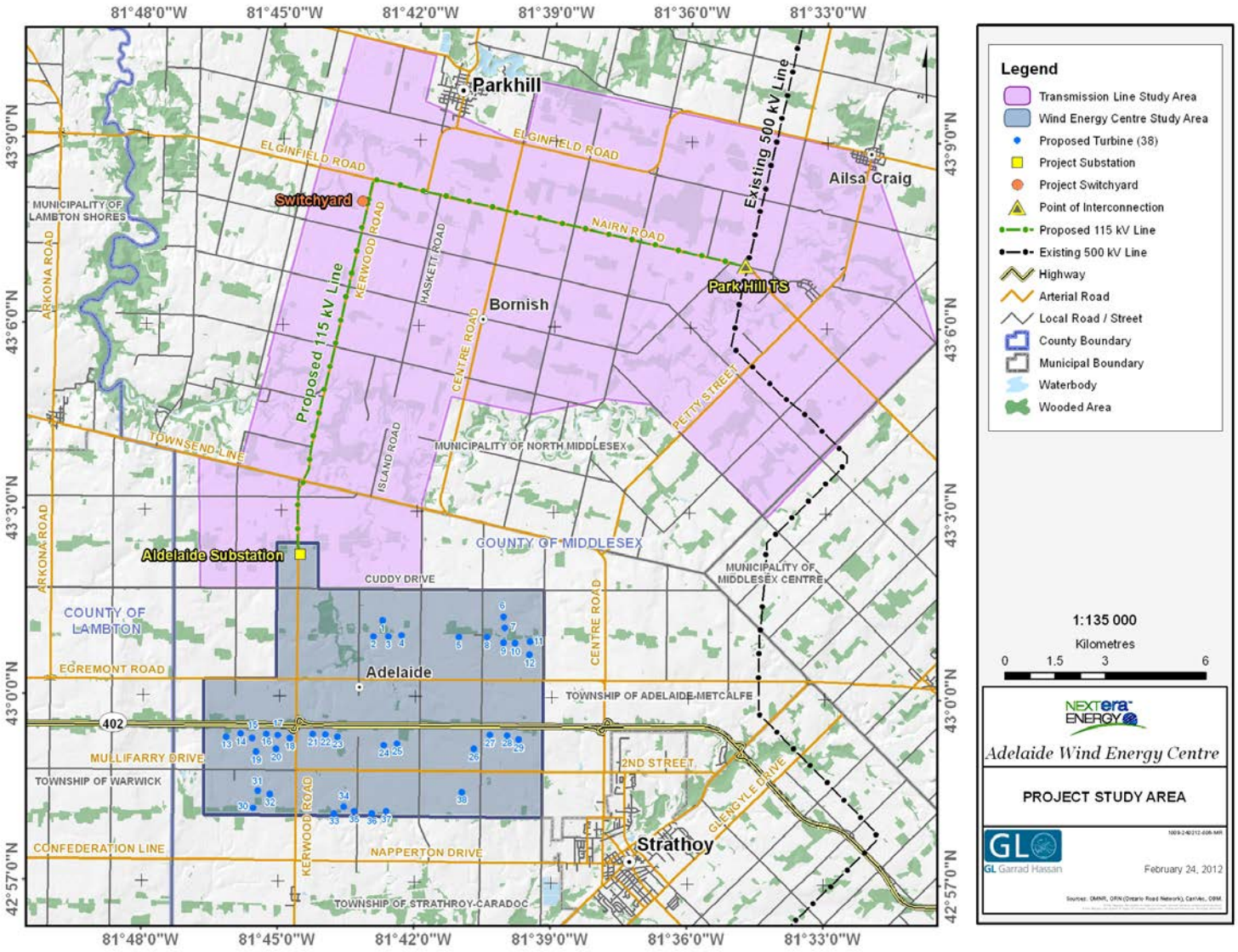

Figure 1-1: Project Study Area

Figure 1-2 through Figure 1-5 are representative of current agricultural land use in the Wind Energy Centre Study Area.

Figure 1-2: Egremont Drive, west of Schools Road

Figure 1-3: Morse Road, north of Egremont Drive

Figure 1-4: Robotham Road, north of Egremont Drive

Figure 1-5: Schools Road, north of Egremont Drive

1.2 Description of the Energy Source, Nameplate Capacity, and Class of Facility

The wind turbine generators of the Project will convert the wind's energy into electricity which will be fed into the Hydro One transmission system. This Project is considered to be a Class 4 Wind Facility. The Project is proposed to consist of 38, 1.62 MW turbines with a total nameplate capacity of up to 59.9 MW, though 38 turbine locations will be permitted.

1.3 Contact Information

Project Proponent

The Project proponent is Kerwood Wind, Inc., a developer of wind energy projects. The primary contact for Kerwood Wind, Inc. for this Project is:

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Project Consultant

GL Garrad Hassan Canada, Inc., a member of the GL Group and part of the GL Garrad Hassan brand, (hereafter referred to as "GL GH") has been retained to lead the REA Process for the Adelaide Wind Energy Centre.

The Environmental and Permitting Services team of GL GH has completed mandates throughout Canada, the United States and in many other parts of the world. These mandates include permitting management, permit applications, environmental impact assessment, and various environmental studies for more than 15,000 MW of wind and solar-PV projects.

GL GH's environmental team is composed of over 20 environmental professionals, including environmental impact specialists, planners, GIS, technicians and engineers.

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1.4 Other Approvals Required

The Project is subject to the provisions of the *Environmental Protection Act* and Ontario Regulation 359/09 and Ontario Regulation 521/10. The issuance of an approval by the MOE will require approval by the Ministry of Natural Resources (MNR) and the Ministry of Tourism and Culture (MTC).

In addition to the approvals required under O. Reg 359/09 and 521/10, the Project will require local approvals such as municipal building permits, as well as a St. Clair Region and/or Ausable Bayfield Conservation Authority permits where potential disturbances to watercourses are anticipated. The Project will also require a permit under the *Endangered Species Act* (ESA), upon completion of an Approval and Permitting Requirements Document (APRD).

1.5 Federal Involvement

This Project is not expected to trigger the *Canadian Environmental Assessment Act* (CEAA), as no federal authority will be expected to provide a licence, permit, certificate or other regulatory authorization. The Project will however be required to obtain land use approval from NAV CANADA and an obstruction clearance from Transport Canada.

2 PROJECT INFORMATION

2.1 Facility Components

The Project will be made up of the following main components:

- Wind turbines;
- Collector system;
- Transmission line;
- Access roads;
- Substation; and
- Operations and maintenance building.

2.1.1 Turbine Specifications

The wind turbine model proposed for the Project is the GE 1.6-100 with a rated capacity of 1.62 MW. The total Project nameplate capacity will up to 59.9 MW, with the final number of turbines to be built depending on a number of factors, including the wind resource and siting restrictions such as setback distances, socio-economic or natural environment constraints, the capacity of the electrical grid, and interest shown by local landowners. In addition, the type of turbine technology selected can also affect the number of turbines, as larger rated turbines can reduce the number of turbines required to achieve a given total installed capacity. The selection of turbine technology is based on the sound and power curve profiles of the turbine as well as the manufacturer's ability to meet Domestic Content requirements within the Ontario Power Authority's Feed-In Tariff contracts.

The turbines will be located on leased farmlands. The turbines are three-bladed, upwind, horizontal-axis wind turbines that are state-of-the-art technology. The turbines have a 100 m rotor diameter with a swept area of 7,854 m; each blade is connected to the main shaft via the hub. The turbine is mounted on an 80 m tubular steel tower which contains an internal ladder for maintenance access. The turbine will be constructed on a foundation measuring approximately 200 m^2. The foundation consists of a wooden frame, poured concrete and steel rebar to provide added strength.

The nacelle at the top of the tower may house the generator, gearbox, bearings, couplings, rotor, and auxiliary equipment. The nacelle typically consists of a bedplate on which all of the electro-mechanical components are mounted, surrounded by an enclosure. The nacelle is typically constructed of fibreglass, lined with sound-insulating foam, is ventilated and the interior is illuminated with electric lights. An internal ladder is provided for maintenance access. Some of the wind turbines will have external lighting in accordance with the requirements of Transport Canada (TC). Please refer to the Wind Turbine Specifications Report for more detailed information on the wind turbines proposed for the Project.

Table 2-1: Summary of turbine technical specifications

Make	**General Electric**
Model	1.6-100
Name plate capacity	1.62 MW
Hub height	80 m
Rotor diameter	100 m
Minimum rotational speed	9.75 rpm
Maximum rotational speed	16.2 rpm

Table 2-2: Adelaide Project - GE 1.6 100 Wind Turbine Acoustic Emission Summary

Frequency (Hz)	**Octave Band Sound Power Level (dBA)**									
	Manufacturer's Emission Level					**Adjusted Emission Level**				
Wind Speed (m/s) at 10m agl	6	7	8	9	10	6	7	8	9	10
63	81.4	84.8	86.3	86.4	86.2	86.2	86.2	86.2	86.2	86.2
125	88.9	92.4	94.4	94.9	95.1	95.1	95.1	95.1	95.1	95.1
250	92.1	93.4	95.5	96.3	96.9	96.9	96.9	96.9	96.9	96.9
500	94.3	95.7	95.9	95.7	95.5	95.5	95.5	95.5	95.5	95.5
1000	93.8	99.2	100.4	100.1	99.9	99.9	99.9	99.9	99.9	99.9
2000	89.8	96.4	99.2	99.3	99.3	99.3	99.3	99.3	99.3	99.3
4000	83.9	87.8	90.0	90.3	90.5	90.5	90.5	90.5	90.5	90.5
8000	67.4	70.7	72.1	72.3	71.6	71.6	71.6	71.6	71.6	71.6
A-Weighted	99.5	103.3	104.9	105.0	105.0	105.0	105.0	105.0	105.0	105.0

2.1.2 Collector System

The 34.5 kV collector lines from each turbine to the substation will be buried on private property adjacent to the turbine access roads, where feasible. The locations of the underground cables and access roads were determined in consultation with the landowners and in accordance with the setback requirements defined in O. Reg. 359/09.

2.1.3 Transmission Line

The 115 kV transmission line that will be built from the Project substation to the switchyard is proposed to be located within the existing road right-of-ways along Kerwood Road. From there, the transmission line will travel east along Elginfield and Nairn Roads within the municipal rights-of-way to an existing Hydro One 500 kV transmission line. It is anticipated that the transmission line will be mounted on existing or on new Hydro One poles. The local utility company may require NextEra to erect additional poles, or replace undersized poles, in order to accommodate the transmission line. The poles are proposed to be constructed of wood, concrete or steel and will be between 18 and 30 m tall.
The interconnection plan for any wind farm is subject to study, design and engineering by the Integrated Electricity System Operator (which manages the province's electricity grid), Hydro One (which owns the transmission lines), the local distribution company, and the Ontario Energy Board (which regulates the industry through the Transmission System Code and the Distribution System Code). Details regarding the transmission lines, and the electrical substation will be developed during the Pre-Construction Design Phase of the Project.

2.1.4 Access Roads

On-site access roads to each turbine will be constructed to provide an access point to the properties for equipment during the construction phase and for maintenance activities during operation. Typically the access roads will be 11 m wide during the construction phase to accommodate the large cranes (with an additional 2 m clearance on each side for travel), and afterwards reduced to 6 m wide during the operations phase.

2.1.5 Substation

Having an overall footprint of 2-3 ha in size, the electrical substation for the Project will be located on privately-held lands through a lease arrangement. The electricity collected via the 34.5 kV underground collection lines will converge at the transformer substation where the electricity will be "stepped-up" to 115 kV for transmission to the switchyard via the above-ground transmission line. The substation equipment will include an isolation switch, a circuit breaker, a step-up transformer, transmission switch gear, instrument transformers, grounding and metering equipment. All substation grounding equipment will meet the Ontario Electrical Safety Code.

A secondary containment system will be installed to capture any leaks from the transformer. Water in the containment system will be visually inspected for any evidence of oil (which would float to the top). If oil is present, a tank truck will be brought to site to pump the water/oil mix into it. The water/oil mix will then be disposed of off-site at a licensed facility. If no oil is detected in the water, the water will be pumped out to an adjacent swale and then allowed to infiltrate into the ground.

The switchyard will be located beside the Bornish Wind Energy Centre substation and will be approximately 2-3 ha in size. The switchyard will also be located on privately-held lands through a lease or purchase arrangement. The switchyard will include switches, breakers, electrical bus work, instrument transformers, grounding, metering equipment, control house and steel structures supporting incoming and outgoing transmission line circuits. Switchyard grounding will meet the Ontario Electrical Safety Code.

From the substation, the 115 kV transmission line will run east to the point of interconnection with the Hydro One grid. The substation at the point of interconnection will be approximately 2-3 ha in size and will be located on a privately-owned adjacent to the 500 kV line.

2.1.6 Operations and Maintenance Building

An operations building, measuring approximately 30 m by 15 m, will be constructed on privately-held lands or an existing suitable structure will be purchased for the purpose of monitoring the day-to-day operations of the Project and supporting maintenance efforts. A small parking lot will be constructed to accommodate staff vehicles. Prior to the construction phase, a Stormwater Pollution Prevention Study will be conducted to address any potential effects associated with stormwater runoff.

Potable water will be supplied by a well or through the municipal water system and a septic bed will be constructed for the disposal of sewage. The septic bed will be constructed to the minimum size required for the size of the operation and maintenance building. It is the Project owner's responsibility to ensure proper maintenance of the septic system. The operations and maintenance building, septic system, and water supply solution will be constructed in accordance with applicable municipal and provincial standards.

2.2 Project Activities

A wind energy project consists of three main phases: (i) site preparation and construction, (ii) operations, and (iii) decommissioning. This section presents an overview of the activities of each of these phases.

2.2.1 Construction and Installation

The Project Location, situated within the broader Project Study Area, is defined in O. Reg. 359/09 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*". As described therein, the Project Location boundary is the outer limit of where site preparation and construction activities will occur (i.e., Disturbance Areas described below) and where permanent infrastructure will be located, including the air space occupied by turbine blades.

Disturbance Areas have been identified surrounding various Project components; such areas correspond to the "Project Location" boundaries in the map in Appendix A. These areas denote zones where temporary disturbance during the construction phase may occur as a result of: temporary Project component laydown and storage areas, crane pad construction or turbine turnaround areas. With the exception of the Project components described above, no permanent infrastructure is proposed within these areas. Following construction activities, the land will be returned to pre-construction conditions.

Construction of the Project will meet or exceed all local regulations and standards (i.e. Ontario Electric Safety Code, Ontario Building Code, etc.). The proposed turbines and associated infrastructure are presented in the map in Appendix A.

Surveying and Geotechnical Study Activities

Surveys will be required for the micrositing of the turbines, crane pads, access roads, electrical lines, and the substation. Crews will drive light trucks to reach sites primarily using existing roads. They will then survey the site on foot and mark the locations using stakes. For the wind farm site, the surveys will typically take one to two days per turbine location.

Existing buried infrastructure located on public property will be identified using the Ontario One Call service and buried infrastructure located on private property will be identified by private contractors prior to construction or geotechnical sampling and updated throughout construction, as required.
Geotechnical sampling will be required for turbine foundation locations. Typically a truck-mounted drill rig visits the sampling locations, drills the borehole and collects geotechnical information. This operation typically uses two operators and requires one to two hours per turbine location.

Any archaeological sites, as identified during the Archaeological Assessment, will be clearly marked in the field. All personnel working on or entering the construction area will be instructed to avoid these areas.

This activity can be summarized as follows:

- Equipment required: At a minimum, trucks, a truck-mounted drill rig, and possibly a track-mounted drill rig.
- Materials brought on site: None. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: These activities will take place prior to construction and are not season-dependent. Preference is to complete this activity in the winter to minimize crop disruption. This operation typically uses two operators and requires one to two hours per site.
- Material generated: Some drill cuttings (composed of soil) will be generated and will be disposed of on site by scattering in the vicinity of the borehole.

Construction of Access Roads

Access roads will be constructed to transport equipment to the construction sites. Typically the access roads will be 11 m wide during the construction phase to accommodate the large cranes (with an additional 2 m clearance on each side for travel), and afterwards reduced to 6 m wide during the operations phase. Access roads for each turbine will vary in length according to its location.

The construction of the access roads will typically require clearing and grubbing of any vegetation, excavation of the topsoil layer, and adding a layer of compacted material to a typical depth of 300 to 600 mm, depending upon site-specific geotechnical conditions. Clean granular material (typically "A" or "B" gravel) will be brought to the site as needed and will not be stockpiled on site. The topsoil will be kept and re-used on site. New culverts may be required to maintain drainage in ditches at junctions with roadways and will be constructed to support the construction equipment and delivery trucks. The location of proposed water crossings will be summarized in the water assessment. The exact culvert details, installation details and erosion control measures will be determined in conjunction with the St. Clair Region and Ausable Bayfield Conservation Authorities as part of their permitting process; however, the

culverts are proposed to be open bottom and are proposed to be left in place following the operations phase, in consultation with the landowner.

Temporary crane paths will also be constructed; these will be 11 m wide and constructed in a manner similar to the other roads described above.

The access road to each turbine will typically require one to three days for construction. Depending on the length of the access roads, construction may require approximately 25 truckloads of gravel.

Municipal and provincial roads will also be used for transporting equipment, and minor modifications may be required to some of the existing roads (e.g. widening the turning radius) to accommodate oversized loads. Any road damages will be repaired.

This activity can be summarized as follows:

- Equipment required: At a minimum, trucks, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers.
- Materials brought on site: Granular material for road construction and steel culverts. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: This activity will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall, depending on the amount of rainfall. The access road to each turbine will typically require one to three days of construction.
- Material generated: Once the construction activities have been completed, the granular base will be removed and distributed to the landowners, if desired, or removed from the site and disposed of in an approved and appropriate manner. The disturbed area will have its topsoil replaced from stockpiled material and will be reseeded in consultation with the landowner.

Construction Temporary Storage Area

A 4 ha (10 acre) site will be constructed for the temporary storage of construction material. Following clearing and grubbing of any vegetation, which is expected to be minimal given the site's agricultural setting, the topsoil at the construction laydown area will be removed and approximately 600 mm of clean compacted crushed gravel will be imported as needed. The excavated topsoil will be kept on site and re-used once the construction phase is completed (e.g. redistributed throughout the Temporary Laydown Area), and as part of the site reclamation strategy. Construction activities are expected to last approximately one week and will require 100 loads of gravel, and a crew of six persons.

This activity can be summarized as follows:

- Equipment required: At a minimum, trucks, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers.
- Materials brought on site: Granular material as required to maintain a stable base. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction

equipment. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.

- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall, depending on the amount of rainfall.
- Material generated: Some topsoil will be need to be stripped; however, it will be kept on site and re-used at the end of the construction phase as part of the site reclamation strategy.

Crane Pads and Laydown Areas

At each turbine site a crane pad as well as laydown area will be prepared.

In order to provide sufficient area for the laydown of the wind turbine components and their assembly, a 122 m by 122 m square around the wind turbine site must be cleared, grubbed, levelled, and made accessible during the construction phase. The topsoil is typically removed and some material may need to be added depending upon site-specific geotechnical conditions. Where the site laydown areas are close to watercourses, erosion control measures will be implemented, as described below in Section 3.

Crane pads will be constructed at the same time as the access roads and will be located adjacent to the turbine locations. The crane pads will typically measure 15 m by 35 m. The topsoil at the crane pad will be removed and approximately 600 mm of clean compacted crushed gravel will be imported as needed. The excavated topsoil will be re-used on site, as feasible, as part of the site reclamation strategy.

Once turbine erection is complete, the temporary laydown areas will be restored to their prior use, namely by re-using the salvaged topsoil and agricultural debris; crane pads will be reduced to the width of an access road to maintain access to turbines during operations; the other areas previously covered by the crane pads will be restored to prior use, namely by re-distributing the salvaged topsoil and other agricultural debris.

Construction equipment typically includes trucks, graders, and bulldozers. The construction crew is anticipated to comprise four to six persons and construction activities are expected to last approximately one to two days per turbine.

This activity can be summarized as follows:

- Equipment Required: At a minimum, trucks, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers.
- Materials brought on site: granular material as required to maintain a stable base. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall, depending on the amount of rainfall.
- Material generated: Some topsoil will be need to be stripped; however, it will be kept on site and re-used at the end of the construction phase as part of the site reclamation strategy.

Delivery of Project Components

Project components will be delivered by truck and trailer throughout the construction phase and stored at the temporary laydown areas surrounding each turbine. A traffic management plan will be developed using MTO Book 7 standards and will be provided to Middlesex County. Alternative traffic routes will be prepared to address traffic congestion, as needed.

Turbine Foundations

A backhoe will be used to excavate an area approximately 3 m deep and measuring roughly 20 m x 20 m with the material being stockpiled for future backfilling. Stockpiled material will have topsoil and subsoil separated out and surplus excavated material, excluding topsoil, will be removed from the site for disposal in an approved manner. The foundation, with an approximate footprint of 400 m^2, will be constructed of a wooden frame, poured concrete and reinforced with steel rebar to provide strength. The construction timeframe for turbine foundations is three to four days, excluding curing time. After construction the foundation will be backfilled and the surface will be landscaped for drainage. The only surface evidence of the foundation will be a small protrusion of concrete to which the tower is attached; as such land can be cultivated to within a few metres of the turbine.

Typical construction equipment, on a per-turbine basis, will include:

- Excavator for removing material;
- Flatbed trucks (four to six) for delivery of rebar, turbine mounting assembly and forms;
- Track-mounted crane or rough terrain forklift for unloading and placement of rebar and forms;
- Concrete trucks for delivery of concrete (30-40 loads);
- Construction trucks (three to four vehicles with multiple visits); and
- Dozer, loader, and trucks to backfill and compact foundation and remove surplus excavated materials.

This activity can be summarized as follows:

- Materials brought on site: Concrete, rebar and wood. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall, depending on the amount of rainfall.
- Material generated: Some wood waste will be generated from the wood used to construct the foundations. This will be removed from the site and recycled. Spent welding rods may also be generated which will be disposed of as hazardous waste by a licensed contractor. Excavated subsoil will be removed from the site and disposed of in an appropriate manner.

Wind Turbine Assembly and Installation

Turbine components will arrive on site using flatbed and other trucks and will be temporarily stored on-site in the immediate vicinity of the base prior to assembly. Typically, two cranes will be used to install the turbines. The larger crane is usually a crawler type with a capacity of 400 tonnes or larger, and is used for the higher lifts.

Clearing and grubbing will be required for the erection area. The erection cranes and crew will follow the foundation crew and erect the wind turbines once the foundations are completed and the concrete has set. This will typically be achieved in five lifts (three for the towers, one for the nacelle and one for the rotor) over a period of two to three days. The lower tower sections may be installed several days before the upper tower sections, nacelle, and rotor to optimize the installation sequence. The lower tower section will also include electrical and communications equipment. Total turbine assembly and installation will typically require four to five days per turbine. Fifteen to twenty persons may be required at the site during the turbine installation; they will be transported using light duty vehicles.

The larger track-mounted crane can move from turbine site to turbine site; however, it will need to be disassembled to transport it along roadways and to mobilize/demobilize it to and from the Project site.

Following commissioning, the surrounding area will be returned to its original use.

This activity can be summarized as follows:

- Equipment Required: At a minimum, trucks, two cranes, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported by trailers.
- Materials brought on site: Towers, nacelles, blades and hub. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall, depending on weather conditions. Total assembly time will be four to five days per turbine.
- Material generated: Some packing material waste will be generated. The recyclable material will be separated from the non-recyclable material on-site. Both streams of waste will be removed by a licensed sub-contractor. Spent welding rods may also be generated, which will be disposed of as hazardous waste by a licensed contractor. Packing frames for the turbine components will be returned to the turbine vendor.

Electrical Collector System

The electrical collector system will consist of pad-mounted transformers, underground cabling for use on private property, and a buried collection system running along road rights-of-way. These components are described below.

- Pad Mount Transformers: A concrete transformer pad, approximately 2.2 m by 2.5 m in size, will be installed at each turbine at the same time as the turbine base installation. The construction will consist of excavation, soil storage, installation of the buried electrical grounding grid, installation of the concrete pad, installation of the transformer, and electrical connections. Transformer

installation and cabling between the turbine and transformer is expected to take three days per turbine. Equipment will include flatbed trucks to transport the equipment to site, and a track-mounted crane will likely be used for the installation. These activities will likely require four to six trucks, a workforce of two persons per vehicle per day, and will last between four to six days.

- Collection Lines: Cables and fibre-optic lines (for communications) will be buried from each turbine to the step-up transformer station and will be located under or alongside the access roads where feasible. The excavated soil will be stored temporarily and then reused as backfill. Power conductors will be approximately 0.9 m below grade and the location will be marked. Farming practices will not be affected by the underground cabling due to the depth of the cables and location of the cable beneath the access roads. Equipment will include trenchers or diggers (depending on soil type) and construction will require a crew of six persons. The construction timeframe is dependent upon the required length of the lines.
- Horizontal Directional Drilling: Electrical cables may need to be installed using horizontal directional drilling to minimize effects to woodlots or watercourses. Erosion control devices will be installed at the drill location and drill cuttings will be collected and removed from the site for disposal in an approved and appropriate manner. An entrance and exit pit is excavated on either side of the feature to be bored under. The directional drilling equipment is set up at the entrance pit and a drill bit attached to rod segments is advanced until it reaches the exit pit. A slurry of bentonite and/or polymer mixed with water is injected into the hole while drilling to help stabilize the bore hole and reduce friction. Once the drill bit has reached the exit pit, the drill bit is removed and a "reamer" is attached and pulled back through the hole to enlarge the bore by 120-150%. The electrical cable will then be installed through the hole. Equipment will include a directional drilling rig and two to three support trucks to carry drilling rods, drilling supplies, and cable.

This activity can be summarized as follows:

- Materials brought on site: Electrical cabling. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment, and the polymer used for directional drilling. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall, depending on weather conditions.
- Material generated: Some packing material waste will be generated. The recyclable material will be separated from the non-recyclable material on site. Both streams of waste will be removed by a licensed sub-contractor.

115 kV Transmission Line

The 115 kV electrical transmission line that will be built from the Project substation to the switchyard is proposed to be located within the existing road rights-of-way along Kerwood Road. From there, the transmission line will travel east along Elginfield and Nairn Roads within the municipal rights-of-way to an existing Hydro One 500 kV transmission line. It is anticipated that the transmission line will be mounted on existing or on new Hydro One poles. The local utility company may require NextEra to erect additional poles, or replace undersized poles, in order to accommodate the transmission line. The poles are proposed to be constructed of wood, concrete or steel and will be between 18 and 30 m tall.

Holes are typically augured in the ground using a truck-mounted auger device. The poles are then inserted using special cranes to a typical depth of 1 to 2 m below grade. The poles are then "dressed" (made ready to accept conductors) using a boom truck. Typically, one crew will install the poles and one crew will dress them. Approximately six construction vehicles (including trucks and a pole loader) and a crew of 12-15 persons are anticipated for construction of the transmission lines. Twelve to sixteen poles can be installed and dressed in one day. Once the poles are in place and dressed, cables are strung in place using boom trucks and special cable reel trucks. Lastly, any pre-existing poles that are no longer in use are removed. Some packing-material waste may be generated. All recyclable materials will be separated from non-recyclable materials and both streams will be removed from the site and disposed of at an approved and licensed facility.

The interconnection plan for any wind project is subject to study, design and engineering by the Integrated Electricity System Operator (which manages the province's electricity grid), Hydro One (which owns the transmission lines), the local distribution company and the Ontario Energy Board (which regulates the industry through the Transmission System Code and the Distribution System Code).

Equipment will include, at a minimum, a truck-mounted crane, flatbed trailers and a truck-mounted auger. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.

Substations and Switchyard

Having an overall footprint of 2-3 ha in size, the electrical substation for the Project will be located on privately-held lands through a lease arrangement. The substation equipment will include an isolation switch, a circuit breaker, a step-up power transformer, transmission switch gear, instrument transformers, and grounding and metering equipment. Substation grounding will meet the Ontario Electrical Safety Code.

As explained above, a 115 kV transmission line will be built to connect the Project to a Hydro One 500 kV line, which will run from the Project's substation to a switchyard located to the north, and then run east to the point of interconnection. The substation at the point of interconnection will be approximately 2-3 ha in size and will be located on privately-owned land adjacent to the 500 kV line.

The switchyard will be located beside the Bornish Wind Energy Centre substation and will be approximately 2-3 ha in size. The switchyard will also be located on privately-held lands through a lease arrangement. The switchyard will include switches, breakers, electrical bus work, instrument transformers, grounding, metering equipment, control house and steel structures supporting incoming and outgoing transmission line circuits. Switchyard grounding will meet the Ontario Electrical Safety Code.

The substation and switchyard areas will be gravelled with clean material imported to the site on an as-needed basis and sloped to facilitate drainage. A secondary containment system will be installed around the transformer in the event of an oil leak to prevent any soil contamination.

Construction is expected to last approximately four months. During construction of the substation, topsoil and subsoils will be stripped and stockpiled separately. Stripped topsoil and subsoil will be replaced in

the temporary storage facility area and topsoil stripped from the substation area will be distributed on other Project properties. The construction crew will consist of approximately 25-40 persons.

Both streams of waste will be removed by a licensed sub-contractor.

This activity can be summarized as follows:

- Equipment Required: Small trenchers, a small crane, forklifts, concrete trucks and a bulldozer. The trucks and graders will be driven to the site and the bulldozers will be transported by trailers.
- Materials brought on site: gravel, an isolation switch, a circuit breaker, a step-up power transformer (34.5 to 44 kV) switch gear, instrument transformers, grounding and metering equipment, insulators, transformer oil, and electrical cabling. The trucks and graders will be driven to the site and the bulldozers will be transported by trailer. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment and transformer oil. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall, depending on weather conditions.
- Material generated: Some packing material waste will be generated. The recyclable material will be separated from the non-recyclable material on site. Both streams of waste will be removed by a licensed sub-contractor.

Operations Building

An operations building measuring approximately 30 m by 15 m will be assembled on privately-held lands or an existing suitable structure will be purchased. The facility will be used to monitor the day-to-day operations of the Project and to support maintenance efforts. A small parking lot will be constructed to accommodate staff vehicles. Prior to the construction phase, a Stormwater Pollution Prevention Study will be conducted to address any potential effects associated with stormwater runoff.

Potable water will be supplied by a well or through the municipal water system and if required, a septic bed will be constructed for the disposal of sewage. The septic bed will be constructed to the minimum size required for the size of the operation and maintenance building. Both will be constructed in accordance with applicable municipal and provincial standards. Construction of the operations building may take up to three months to complete. It is anticipated that construction activities will require approximately 10-15 persons.

This activity can be summarized as follows:

- Equipment Required: At a minimum, forklifts, concrete trucks and smaller crew trucks.
- Materials brought on site: a pre-fabricated building structure. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall, depending on weather conditions.

- Material generated: Some packing material waste will be generated. The recyclable material will be separated from the non-recyclable material on site. Both streams of waste will be removed by a licensed sub-contractor.

Permanent Meteorological Towers

Permanent meteorological towers may be installed at the Project. These masts typically measure up to 80 m in height and use either a monopole or lattice structure installed using a drill truck. The towers will be erected using winches and secured with three guy wires attached to anchors or a small monopole foundation. No significant soil or vegetation disturbance is anticipated. Construction of the meteorological tower will take approximately two days and require a crew of six persons.

This activity can be summarized as follows:

- Equipment Required: A drill truck and winches for tower erection will be required.
- Materials brought on site: monopole type or lattice meteorological tower, guy wires, and anchors.
- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather and will take approximately two days. If necessary, this activity can be completed in the spring or fall, depending on weather conditions.
- Material generated: Some packing material waste will be generated. The recyclable material will be separated from the non-recyclable material on site. Both streams of waste will be removed by a licensed sub-contractor.

Clean-up and Reclamation Strategy

Site clean-up will occur throughout the construction phase and site reclamation will occur after construction has been completed. Waste and debris generated during the construction activities and not re-usable on site as part of the reclamation strategy will be collected and disposed of at an approved facility. All reasonable efforts will be made to minimize waste generated and to recycle materials including returning packaging material to suppliers for reuse/recycling. During construction, industry best practices for spill prevention will be utilized. In the unlikely event of a minor spill, the latter will be cleaned up immediately and any impacted soils will be removed from site and disposed of at an approved and appropriate facility; details on emergency response are provided in the Emergency Response Plan as part of the Design and Operations Report for this Project. At the conclusion of construction, vehicles and construction equipment will be removed from the site.

Stripped soil will be replaced and re-contoured in the construction areas and disturbed areas will be re-seeded, as appropriate. Erosion control equipment will be removed once inspections have determined that the threat of erosion has diminished to the original land use level or lower. High-voltage warning signs will be installed at the transformer substation and elsewhere, as appropriate.

Turbine Commissioning

Turbine commissioning will occur once the wind turbines and substation are fully installed and Hydro One is ready to accept grid interconnection. The commissioning activities will consist of testing and inspection of electrical, mechanical, and communication systems.

Temporary portable generator sets may be used to electrically commission the turbines prior to connection to the grid. The generators are required for approximately one day per turbine. The generators are supplied with a Certificate of Approval to the owners. Following the commissioning phase, the portable generators will be removed from the site and returned to the owners.

This activity can be summarized as follows:

- Equipment Required: Support trucks which will be driven to the construction site.
- Materials brought on site: Gearbox oil, lubricating grease, two temporary portable generators. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment and portable generators, gearbox oil, and lubricants. Fuel handling will be conducted in compliance with the mitigation measures outlined in Section 3.
- Timing: This will preferentially be completed in late spring or summer to take advantage of typically drier weather. If necessary, this activity can be completed in the spring or fall or winter depending on weather conditions.
- Material generated: Some packing material waste will be generated. The recyclable material will be separated from the non-recyclable material on site. Both streams of waste will be removed by a licensed sub-contractor.

2.2.2 Operations

The Project will require full-time technical and administrative staff to maintain and operate the facility. The primary workers will be wind turbine technicians along with a site supervisor.

The wind turbines will be operating (i.e. in "Run" mode and generating electricity) when the wind speed is within the operating range for the turbine and there are no component malfunctions.

Each turbine has a comprehensive control system that monitors the subsystems within the turbine and the local wind conditions to determine whether the conditions are suitable for operation. If an event occurs which is considered to be outside the normal operating range of the turbine (such as low hydraulic pressures, unusual vibrations or high generator temperatures), the wind turbine will immediately take itself out of service and report the condition to the Operations Centre. A communication line connects each turbine to the Operations Centre, which closely monitors and, as required, controls the operation of each turbine. The wind turbine system will be integrated with the electric interconnection Supervisory Control and Data Acquisition (SCADA) to ensure that the Project critical controls, alarms, and functions are properly co-ordinated for safe, secure, and reliable operation.

Use of Meteorological Data

The use of meteorological data is key to the safe and efficient operation of a wind project. Some operational decisions made using meteorological data include:

- Cut-in wind speed;
- Cut-out wind speed;
- Turbine shut-down during icing conditions; and
- Turbine shut-down during extreme weather events.

Routine Turbine Maintenance

Routine preventive maintenance activities are scheduled at six-month intervals with specific maintenance tasks scheduled for each interval. Maintenance is performed by removing the turbine from service and having two to three wind technicians spend a full day carrying out maintenance activities up-tower.

Consumables such as the various greases used to keep the mechanical components operating and oil filters for gearboxes and hydraulic systems are used for routine maintenance tasks. Following all maintenance work on the turbine, the area is cleaned up. All surplus lubricants and grease-soaked rags are removed and disposed of as required by applicable regulations. All maintenance activities will adhere to the same spill prevention industry best practices observed during the construction phase.

Unplanned Turbine Maintenance

Modern wind turbines are very reliable and the major components are designed to operate for approximately 30 years. However, wind turbines are large and complex electromechanical devices with rotating equipment and many components. With large numbers of turbines it is inevitable that component failures will occur despite the high reliability of the turbines fleet-wide. Most commonly, the failure of small components such as switches, fans, or sensors will take the turbine out of service until the faulty component is replaced. These repairs can usually be carried out on site by a single technician in a few hours.

Events involving the replacement of a major component such as a gearbox or rotor are not typical. If they do occur, the use of large equipment, sometimes as large as that used to install the turbines, may be required.

It is possible that an access road, built for construction and returned to farmland when the construction phase is completed, would need to be rebuilt to carry out repairs to a damaged turbine. Typically only a small percentage of turbines would need to be accessed with large equipment during their operating life.

Electrical System Maintenance

The collector lines and substation will require periodic preventive maintenance activities. Routine maintenance will include condition assessment for above-ground infrastructure and protective relay maintenance of the substation in addition to monitoring of the secondary containment system for traces of oil. Lastly, vegetation control will be required around the transmission line to prevent any damage to the line and ensure safe operation.

2.2.3 Decommissioning

The anticipated life of the Project is estimated to be a minimum of 25 years. The following sections describe how the Project will be dismantled either during construction (although unlikely) or following the operations phase of the Project.

Decommissioning During Construction

Although it is unlikely that the Project would be decommissioned prior to the operations phase, should this occur, the actual procedures for dismantling the Project would depend upon the state of construction activities. Dismantling would follow the steps outlined in the Section "Procedures for Dismantling" below and any exposed soils would be re-seeded in consultation with the landowner.

Decommissioning After Ceasing Operations

Should it be decided to not repower the Project at the end of its service life, the steps outlined in the Section "Procedures for Dismantling" would be taken to dismantle the various Project components.

Procedures for Dismantling

If the facility is to be decommissioned and the turbines are to be removed at the end of its service life or during construction, the procedures will be similar to the construction phase, but in reverse sequence.

The procedures will include:

1 The creation of temporary work areas. In order to provide sufficient area for the laydown of the disassembled wind turbine components and loading onto trucks, a 122 m x 122 m square must be cleared, levelled. and made accessible. The topsoil will be removed and some material may need to be added.

2 The creation of crane pads. The crane pads will typically be 15 m x 35 m in size and will be located within the temporary work area around each wind turbine. The topsoil at the crane pad will be removed and approximately 600 mm of compacted crushed gravel will be added. Once the turbine disassembly is complete, the gravel area around each turbine will be removed and the area will be restored to prior use using stockpiled topsoil.

3 The use of cranes to remove the blades, hub, and tower segments.

4 The use of trucks for the removal of turbines, towers, and associated equipment.

5 The top 1 m of the turbine foundations will be removed and replaced with clean fill and stockpiled topsoil. This will be contoured to allow cultivation in the case of agricultural lands.

6 Roads and culverts will be removed unless the landowner requests that they be left in place. Road bedding material will be removed and replaced with clean subsoil and topsoil for reuse by the landowner for agricultural purposes. If requested by the landowner and subject to approval by the ABCA and the MNR, the culverts will be removed and the land will be contoured to maintain the current drainage patterns.

7 Underground electrical lines will be cut, the ends buried to 1 m below grade, and left in place. These lines are inert and will have no negative impacts on the environment, soil and cultivation practices. Overhead lines and poles that are not shared with Hydro One will be removed and the holes will be filled with clean fill.

8 The substation and operations building will be dismantled. These will be decommissioned in a manner appropriate to and in accordance with the standards of the day. All materials will be recycled, where possible, or disposed off site at an approved and appropriate facility.

Restoration of Land

Abandonment of the wind turbines will not result in any impacts to surface or groundwater quality. After the abandonment process is completed the land will be returned to previous agricultural conditions.

Once the equipment has been removed, the land will be restored to its previous agricultural capacity. This will be accomplished by removing the foundations (or part of foundation), granular material from roadways and culverts, depending on the landowner preference. Agricultural capacity will be restored and the land re-contoured to maintain proper drainage. Preferably, this will be accomplished using stockpiled subsoil and topsoil. If there is insufficient material onsite, topsoil and/or subsoil will be imported from a source acceptable to the landowner.

Although strict spill prevention procedures will be in place, the potential for small spills of solvents or fuels exists through the routine maintenance of the turbines, operation of the substation and/or decommissioning process. The soil conditions of the turbine areas will be surveyed per current standards to determine if any impacts have occurred. Should soil impacts be noted, the impacted soils will be delineated, excavated and removed, per applicable standards, from the site for disposal at an approved and appropriate facility. The removed soils will be replaced with stockpiled subsoil and topsoil, if available. If no subsoil or topsoil is available onsite, clean fill and topsoil will be imported.

2.3 Hazardous Waste Disposal, Sewage and Stormwater Management and Water-Taking Activities

All hazardous material will be treated using best practices. Hazardous material including fuel, oils, and grease may not be stored on site, but off site in a designated safe storage area. Disposal of hazardous wastes will only be required in the event of an accidental spill. The effect of accidental spills will be minimized by ensuring that relevant industry regulations are followed including (i) refuelling construction equipment only at crane pads or designated areas, (ii) storing hazardous materials off site at designated safe storage areas, and (iii) maintaining emergency spill kits on the Project site.

The final decision on waste disposal or recycling will be the responsibility of the on-site contractor who will refer to the *Environmental Protection Act* before submitting a Generator Registration Report for each waste type produced at the facility.

Stormwater management will be practiced through the installation of erosion and runoff prevention measures during the construction and decommissioning phases, where necessary.

Water takings, if required, will be conducted as outlined in the Water Assessment Report which is found as part of the complete REA Application package.

2.4 Project Location Map

Appendix A illustrates the Project site area and vicinity. The map identifies off-site land uses, cultural and heritage features, and water bodies within the Project area and within a radius of 300 m thereof.

2.5 Land Ownership

Turbines and substation will be located entirely on private land. Bornish Wind LP currently holds land lease "options" for the properties on which Project components are proposed. Municipal lands (rights-of-way) will be used in some cases for transmission lines and connection to the provincial grid.

Legal descriptions of the parcels of the land that will be used for the proposed renewable energy generation facility are presented in Appendix B.

3 ENVIRONMENTAL EFFECTS MONITORING PLAN

This section presents a summary of potential effects, mitigation measures and residual effects associated with Project-environment interactions during the construction phase and operations phase of the Project. For the sake of completeness, construction phase effects are also discussed and presented here, but are also found in the Construction Plan Report.

More detailed discussions relating to natural heritage impacts, archaeological and heritage impacts, noise impacts, land use impacts and water body impacts are found in the Natural Heritage Assessment reports, Archaeological Assessment Reports, Heritage Report, Noise Impact Assessment, Property Setback Assessment, and Water Body Report, part of the complete REA Application package.

3.1 Methodological Approach

As requested under the REA, potential effects from the construction, installation, and operation of the wind farm have to be assessed while considering applicable mitigation and compensation measures. In order to assess *residual* effects from a Project (i.e. after considering mitigation/compensation measures), GL GH uses the residual effect definitions elaborated by the Canadian Environmental Assessment Agency. A residual effect "level" and "significance" is then applied, as presented in Table 3-1 below.

Table 3-1: Levels of residual effects and significance of effect

Residual Effect	Level of Concern	Residual Effect Significance
Potential impact could threaten sustainability of the resource and should be considered a management concern. Research, monitoring and/or recovery initiatives should be considered.	High	Significant
Potential impact could result in a decline in resource to lower-than-baseline but stable levels in the study area after Project closure and into the foreseeable future. Regional management actions such as research, monitoring and/or recovery initiatives may be required.	Medium	Significant
Potential impact may result in a slight decline in resource in study area during the life of the Project. Research, monitoring and/or recovery initiatives would not normally be required.	Low	Not Significant
Potential impact may result in a slight decline in resource in study area during construction phase, but the resource should return to baseline levels.	Minimal	Not Significant

Depending on the outcome of the effects assessment, follow-up and/or monitoring programs could be proposed in order to further investigate the potential effects, or to verify the significance of the effect following commissioning.

Construction

Table 3-2: Potential negative effects and mitigation measures – Construction

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Cultural Heritage (Protected Properties, Archaeological and Heritage Resources				
Disturbance or displacement of archaeological resources by any ground disturbance activity.	Avoid disturbance/loss of archaeological sites.	Conduct Archaeological Assessment and apply recommended avoidance measures and other measures from licensed archaeologist or MTCS to project design. Details of the Archaeological Assessment can be found in the reports on this subject as part of the complete REA application package.	The Archaeological Assessment was undertaken as per MTCS guidelines and this Project has received confirmation from the MTCS. The likelihood and magnitude of this residual effect is considered non significant.	Immediate notification of the Archaeologist and the Ministry of Tourism, Culture and Sport (MTCS) In the event archaeological resources are found. Apply monitoring measures as recommended by the MTCS.
Natural Heritage				
Direct vegetation removal – significant woodlands, wetlands and valleylands.	Minimize direct impacts on significant vegetation communities.	Detailed vegetation inventory of species and abundance to be removed within significant natural features or wildlife habitats to confirm no rare species will be removed. Re-planting following an area ratio of 1:1 of similar species association (native species) if area to be removed is greater than 1% of the woodland cover. Clearly delineate work area within 30 m of significant natural features or wildlife habitats using erosion fencing, or similar barrier, to avoid accidental damage to species to be retained. Maintain vegetative buffer around water	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	Monitor the success of any re-vegetated areas three (3) times during the first year, and once in each of the next 2 years. Any unsuccessful plantings noted on (or before) assessment within the 2nd year will be re-planted.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		bodies. Any vegetation removal required along roadside collector lines or transmission lines should be minimized and occur completely within the road right of way where possible. Any tree limbs or roots that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques. No vegetation removal will occur in rare plant communities. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.		
Disturbance of local wildlife- significant woodlands, wetlands and valleylands.	Avoid direct impacts on breeding birds and their habitats. Minimize impacts on species that are relatively inactive at night and not accustomed to nighttime disturbances.	Avoid vegetation removal within 30 m of a significant natural feature during the breeding bird period (May 1st – July 15th), or hire a biologist to conduct nest searches prior to vegetation removal, Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Sedimentation and	Maintain or	Implement a sediment and erosion control	The Natural Heritage The	Environmental supervision during

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
erosion - significant woodlands, wetlands and valleylands.	restore vegetated buffers, including riparian zones.	plan within 30 m of a significant natural feature or wildlife habitat. Install, monitor, and maintain erosion and sediment control measures (i.e. silt fences) around the construction areas within 30 m of a significant natural feature or wildlife habitat. Schedule grading to avoid times of very high runoff volumes, wherever possible. Locate entry/exit pits at least 30 m from significant natural features. Collect drill cutting as they are generated and place in a soil bin or bag for off-site deposal. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures.
Spills (i.e. oil, gasoline, grease, etc.) - significant woodlands, wetlands and valleylands.	Avoid contamination of significant natural features.	All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30 m from any significant natural feature or significant wildlife habitat. Develop a spill response plan and train staff on appropriate procedures. Keep emergency spill kits on site. Dispose of waste material by authorized and approved offsite vendors.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Develop a spill response plan and train staff on appropriate procedures. Keep emergency spill kits on site.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.		
Changes in soil moisture and compaction - significant woodlands, wetlands and valleylands.	Minimise impact to soil moisture regime and vegetation species composition.	Implement infiltration techniques to the maximum extent possible. Minimize paved surfaces and design roads to promote infiltration. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Changes to surface water hydrology - significant woodlands, wetlands and valleylands.	Maintain existing surface water flow patterns.	Limit changes in land contours. Maintain streams and timing and quantity of flow. Minimize grading activities to maintain existing drainage patterns where possible. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Direct vegetation removal – bat habitats.	Protection of bat roosting habitat.	Clearly delineate work area using erosion fencing, or similar barrier within 30 m of significant bat habitat, to avoid accidental damage to potentially significant bat roosting trees. Details of the Natural Heritage Assessment can be found in the reports on this subject as	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		part of the complete REA application	significant.	
Disturbance of local wildlife-significant bat habitats.	Avoid disturbance of locally roosting bat species. Determine if local bat populations are adversely impacted by the presence of operational turbines.	Construction activities will not occur within 30 m of BMA 001 and BMA 002. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Direct vegetation removal – significant raptor wintering areas.	Protect raptor wintering areas.	If determined to be significant, clearly delineate work areas within 30 m of significant raptor habitat using erosion fencing, or similar barrier, to avoid accidental vegetation damage within raptor wintering areas. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Disturbance of local wildlife- significant amphibian breeding habitats.	Minimise disturbance of local wildlife habitat. Determine if amphibian populations or species abundance are being impacted by Project	If habitat is determined to be significant, Clearly delineate work area within 30 m of habitat using erosion fencing, or similar barrier, to avoid accidental damage to potentially significant amphibian breeding habitat. Post speed limits along construction access roads, and maintain signage during the operational phase of the Project.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	Post-construction amphibian egg mass and call surveys will be repeated at any of these habitats deemed to be significant for one (1) year following the same methods utilized during pre-construction surveys. Based on the results of the 1st year post-construction monitoring, the need for an additional monitoring (up to 2 years) will be determined in consultation with MNR. Details of the post-construction monitoring program are found in the Natural Heritage

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
	components.	Where amphibian movement corridor is identified as part of the pre-construction survey, an amphibian-friendly culvert where be installed where proposed access roads could act as a barrier to amphibian movement. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application.		Assessment documents.
Increased species competition through introduction of invasive, non-native species- Carey's Sedge and Yellow Stargrass Habitats	Avoid introduction of invasive or non-native species into habitats.	Clearly delineate work areas within 30 m of significant habitats using erosion fencing, or similar barrier, to minimize seed transfer into suitable habitat. Regularly clean vehicles and equipment. Minimize the use of vehicles in off-road and non-agricultural habitats where invasive or non-native species are concentrated.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	If determined to be significant, post-construction vegetation surveys will be completed in years 1, 3 and 5 following the same methods used during pre-construction standardized area searches of identified habitats.
Impacts to Species at Risk.	Limit impacts to Species at Risk.	The Project will require a permit under the *Endangered Species Act* (ESA), upon completion of an Approval and Permitting Requirements Document (APRD). This report will be submitted to the local district Ministry of Natural Resources to be reviewed under the authority of the *Ministry of Natural Resources Act*, and will not be submitted as part of this completed REA application.	NA	NA
Water Bodies				

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Water takings resulting in, Reduced stream flow rate. Increased water temperature.	Minimise impacts on stream flow water temperature.	If water takings are required, Control rate and timing of water pumping. Pump from deep wells to infiltration galleries adjacent to water bodies or wetlands. Restrict taking of water during periods of extreme low flow. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Fish habitat alteration/loss	Limit fish habitat alteration/loss	Consideration of design layout to minimize number of crossings. Consider layout distances to water body features and sensitivity of those features. Crossing locations should be selected as to avoid key habitat features (i.e. refuge pool) and cross the feature within a straight reach of the channel as to avoid meanders etc. and cross perpendicular where possible. Crossing structures should be designed to reduce loss and alterations of habitat where possible (i.e. reduces affected area by cutting back from grading limit to road and install headwall, open bottom culvert etc.). Crossing structure should be properly sized and positioned appropriately (angle and embedded) as to avoid erosion issues and creation of potential fish barriers. Crossing structures should be sized	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		appropriately according to municipal engineering standards as to not result in alterations in stream hydrology, scouring or flooding crossing structures. Crossing structure type should be determined in consultation with agency and municipality staff and should consider sensitivity of the water body and location of crossing. Implement trenchless (i.e. directional drilling) technology at crossings where possible. Any loss to the productive capacity of a watercourse must be compensated for under the *Fisheries Act*. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.		
Erosion and sedimentation	Minimize impacts of erosion and sedimentation on water bodies	Implement trenchless (i.e. drilling) technology at crossings where possible. Minimize potential for soil compaction (see Soil Compaction). Controlled vehicle and machinery access routes, keep away from water bodies where possible. Schedule clearing, grubbing and grading activities to avoid times of very high runoff volumes, wherever possible. Implement Flood Response Plan if on-site flooding occurs.	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		Implement Erosion and Sediment Control Plan. Stabilize banks as soon as possible after construction disturbance (i.e. plantings, rock etc.), if insufficient time is available in the growing season to establish vegetative cover, an overwintering treatment such as erosion control blankets, fiber matting etc. should be applied to contain the site over the winter period. Minimize disturbance by keeping construction equipment outside and away from water bodies wherever possible. Work in dry conditions (i.e. low flow period) or isolate in-water work area using good engineering practices and dewatering techniques. Install silt fencing in-water downstream of dewatering activities. Dewatering discharge rates should be evaluated as to not result in erosion and sedimentation to receiving water body. Dewatering discharge should be dissipated (i.e. sand bags, hay bales etc.) and may require to be split to more than one location Implement Stormwater Management Plan Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application		
Water Quality Impairment	Minimize any negative impacts	Implement Erosion and Sediment Control Plan.	The Water Body Assessment was undertaken	Environmental supervision during construction as part of a routine inspection

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
	to water quality	Implement Spill Response Plan. Keep machinery clean and refuel well away from any water body (>30 m). Fuel and other construction related chemical stored securely away from water bodies (>30 m). Any discharges to a water body must meet MOE Policy 2 standards (at or better water quality that than of the receiving water body). Adequately treat any discharge water prior to discharge as to meet MOE policy 2 standards (i.e. filer bags). Implement Stormwater Management Plan. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.	as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	program will be implemented to ensure adherence to the prescribed mitigation measures.
Temporary disruption of fish habitat (in-water work)	Limit disruption of fish habitat	Restrict construction during sensitive timing windows, as indicated by local OMNR. Work in the dry (i.e. low flow) or isolate work area using good engineering practices or by working in dry conditions using accepted methods to bypass flows. Machinery should be operated in a manner That minimizes disturbance to the banks and bed of the watercourse. Stabilize banks as soon as possible after construction disturbance (i.e. plantings, rock etc). Details of the Water Body Assessment can	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		be found in the reports on this subject as part of the complete REA application.		
Water Level Alteration	Minimize alteration of water level	Dewatering ZOI and rates should be determined prior to dewatering and assessed for impact on affected water bodies. Implement Water Level Response Plan, trigger criteria to be determined in consultation with OMNR. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures.
Soil Compaction		Controlled vehicle access routes. Staging areas should be located away from water bodies (i.e. 30 m). Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Debris entering a water body	Limit the amount of debris entering water bodies	Construction debris should be stabilized (i.e. tarps) away from water bodies (i.e. 30 m). Refuse and other material should be appropriately disposed of off-site. Staging areas should be located away from water bodies (i.e. 30 m). Drilling shafts should be located away from water bodies (i.e. 30 m).	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.		
Drilling Frac-out		Conduct appropriate geotechnical studies as to ensure directional drilling is appropriate at that location and will not result in a 'frac-out'. Develop emergency contingency plan in the unlikely event of a 'frac-out' when drilling below a water body, this plan will deal with issues associated with water level alteration, water quality and erosion & sedimentation. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Emissions to Air, including Odour and Dust				
Reduction in air quality due to CAC emissions and dust.	Minimise deterioration of air quality.	Ensure proper operation and maintenance of vehicles and machinery to limit noise, CAC emissions and leaks. Use water or water-based dust suppressant to control dust on unpaved roads. Implement speed limits on unpaved roads. Minimize vehicular traffic on exposed soils and stabilize high traffic areas with clean gravel surface layer or other suitable cover material. Minimize mud tracking by construction vehicles along access routes and areas outside of the immediate work site, and ensuring timely cleanup of any tracked mud, dirt and debris.	The likelihood and magnitude of this residual effect is considered non significant.	Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in emergency Response and Communications Plan)

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		Cover or otherwise containing loose construction materials that have potential to release airborne particulates during transport, installation or removal. Restore temporary construction road areas as soon as possible to minimize the duration of soil exposure.		
Noise				
Increase in noise levels in Project Study Area	Minimise noise increases for inhabited areas	Ensure proper operation and maintenance of vehicles and machinery to limit noise, CAC emissions and leaks. Implement speed limits on unpaved roads. Construction equipment will be kept in good condition and will not exceed the noise emissions as specified in MOE publication NPC-115.	The likelihood and magnitude of this residual effect is considered non significant.	Faulty equipment resulting in increased noise levels are to be repaired in a timely fashion. Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in emergency Response and Communications Plan)
Local and Provincial Interests, Land, Use and Infrastructure				
Reduction in usable agricultural land.	Minimise reduction in useable agricultural land.	Minimize length of access roads (most agricultural use only affected during construction) where possible.	The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Increased congestion due	Minimise	Notify the community in advance of	The likelihood and	Track all complaints and conduct follow-up

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
to increase in truck traffic and short-term lane closures on local roads during delivery of Project components.	disturbance to local community and achieve zero human safety incident.	construction delivery schedules and installing signage to notify road users of construction activity. If required by municipal authorities develop a traffic management plan for the construction phase and submit to the Municipalities prior to construction and communicate truck routes.	magnitude of this residual effect is considered non significant.	monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan).
Damage to local infrastructure.	Minimise damage to local infrastructure.	Adhere to the best practices regarding the operation of construction equipment and delivery of construction materials. If required by municipal authorities, undertake roads condition survey prior to construction and post-construction.	The likelihood and magnitude of this residual effect is considered non significant.	Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan). If required by local authorities, return damaged infrastructure to original condition (or better) where appropriate.
Areas Protected under Provincial Plans and Policies				
N/A				
Public Health and Safety				
Effects on public health and safety during construction have been described above under Emissions to air, including Odour and Dust, Noise and Local and Provincial Interests Land Use and Infrastructure.				

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Other Resources				
The presence of petroleum wells have been identified through consultation with the OGSR database to be within 75 m of project infrastructure	No negative effects on petroleum resources or the renewable energy project	As part of the Approval and Permitting Requirements Document and as per the Ontario Ministry of Natural Resources (MNR) "Template for Renewable Energy Projects: Setbacks from Petroleum Operations" a site validation of all petroleum wells and facilities identified by the OGSR Library to be within 75 m of the Project location was conducted and confirmed that there are NO petroleum wells or facilities existing within 75 m of the Project location. Notice of the findings has been reported to the Aylmer District MNR.	N/A	N/A

Operations

Table 3-3: Potential negative effects and mitigation measures – Operations

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Cultural Heritage				
Alteration of the visual character of a cultural heritage sites.	Minimise visual impact of recognized heritage sites.	Conduct a Heritage Assessment and apply measures recommended by the heritage specialist or by MTCS. Details of the Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Heritage Assessment was undertaken as per MTCS guidelines and this Project is expected to receive confirmation from the MTCS. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Natural Heritage				
Application of herbicides.	Protection of native vegetation species. Minimize impacts to local wildlife and their habitats.	No herbicides will be used within significant features or wildlife habitats. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Direct mortality due to operational wind turbines – bat habitats.	Limit direct mortalities to bats.	Propose obstruction lighting scheme that minimises risk to bat collisions while fulfills Transport Canada requirements. If impacts to bats are observed to be above provincial thresholds, operational mitigation will be implemented. Details of the Natural Heritage	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual	Conduct post construction mortality monitoring according to the document *Bat and Bat Habitats: Guidelines for Wind Power Projects*, dated July 2011. Details of the post-construction monitoring program are found in the Natural Heritage Assessment documents.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		Assessment can be found in the reports on this subject as part of the complete REA application package.	effect is considered non significant.t.	
Disturbance impact of operational turbines on significant bat maternity roosts.	Assess the impact of operational turbines on significant bat maternity roosts within 120 m of a turbine.	If habitat is evaluated to be significant, Propose obstruction lighting scheme that minimises risk to bat collisions while fulfills Transport Canada requirements. If impacts to bats are observed to be above provincial thresholds, operational mitigation will be implemented. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	If determined to be significant, post-construction exit counts and acoustic bat monitoring will be repeated at any of these habitats deemed to be significant for three (3) years following the same methods utilized during pre-construction surveys according to the document *Bat and Bat Habitats: Guidelines for Wind Power Projects*, dated July 2011. Details of the post-construction monitoring program are found in the Natural Heritage Assessment documents.
Disturbance of local wildlife- raptor wintering areas.	Minimise disturbance of local wildlife habitat. Monitor habitat to determine if raptors are still using these habitats in similar numbers to pre-construction results.	If habitat is evaluated to be significant, Use underground cabling or single-wooded overhead poles where feasible. Propose obstruction lighting scheme that minimises risk to bird or bat collisions while fulfills Transport Canada requirements. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	If habitat is evaluated to be significant, post-construction winter raptor surveys will be repeated at this habitat, for one (1) year following the same methods utilized during pre-construction surveys. Details of the post-construction monitoring program are found in the Natural Heritage Assessment documents.
Direct mortality of birds with operational wind turbines	Limit direct mortality to birds due to operational turbines.	Use underground cabling or single-wooded overhead poles where feasible. Propose obstruction lighting scheme that minimises risk to bird or bat collisions while fulfills Transport Canada requirements. Details of the Natural Heritage Assessment can be found in the reports	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non	Bird mortality monitoring will be carried out according to the document *Bird and Bird Habitats: Guidelines for Wind Power Projects*, The first year results and overall program will be discussed with MNR/CWS at the end of the first year. Mitigation measures in the event of demonstrated significant impact to bird populations will be proposed.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		on this subject as part of the complete REA application package.	significant.	Details of the post-construction monitoring program are found in the Natural Heritage Assessment documents.
Direct mortality of dispersing amphibians along access roads – significant amphibian breeding habitats	Limit direct mortalities to amphibians	Post speed limits along construction access roads within 30 m of significant amphibian habitats, and maintain signage during the operational phase of the Project Where amphibian movement corridor is identified as part of the pre-construction survey, an amphibian-friendly culvert where be installed where proposed access roads could act as a barrier to amphibian movement. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	Post-construction amphibian egg mass and call surveys will be repeated at any of these habitats deemed to be significant for one (1) year following the same methods utilized during pre-construction surveys. Based on the results of the 1st year post-construction monitoring, the need for an additional monitoring (up to 2 years) will be determined in consultation with MNR. Details of the post-construction monitoring program are found in the Natural Heritage Assessment documents.
Soil or water contamination.	Avoid contamination of significant natural features.	Implement best management practices. Develop a spill response plan and train staff on appropriate procedures. Keep emergency spill kits on site. Vehicle washing, refueling stations, and chemical storage will be located more than 30 m from natural features or water bodies. Dispose of waste material by authorized and approved offsite vendors. Details of the Natural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Natural Heritage Assessment was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Impacts to Species at	Limit impacts to	The Project will require a permit under	NA	NA

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Risk.	Species at Risk.	the *Endangered Species Act* (ESA), upon completion of an Approval and Permitting Requirements Document (APRD). This report will be submitted to the local district Ministry of Natural Resources to be reviewed under the authority of the *Ministry of Natural Resources Act*, and will not be submitted as part of this completed REA application.		
Water Bodies				
Water quality impairment	No impairment of water quality	Implement Spill Response Plan Address any impacts resulting from design or construction phases Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application package.	The Water Body Assessment was undertaken as per MOE guidelines and this Project is expected to receive confirmation from the MOE. The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Emissions to Air, including Odour and Dust				
Emissions of contaminants from maintenance vehicles.	Limit impact of maintenance vehicles on local air quality.	Ensure proper maintenance and operations of vehicles and machinery to limit noise, CAC emissions and leaks.	The likelihood and magnitude of this residual effect is considered non significant.	Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan).
Noise				
Increase in noise levels	Minimise noise level increases in the Project area. Comply with MOE's permissible sound limits at	Apply the minimum REA setback distance of 550 m for all turbines Calculate noise levels at PoRs and design project to comply with MOE noise guidelines. Details of the Noise Impact Assessment can be found in the reports on this subject as part of the complete REA application	The likelihood and magnitude of this residual effect is considered non significant.	Implement the communications plan and address noise complaints during operations (see Complaints Resolution Process in Emergency Response and Communications Plan). Faulty equipment resulting in increased noise levels are to be repaired in a timely fashion.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
	all identified Points of Reception. Receive limited complaints	package.		
Local and Provincial Interest, Land Use and Infrastructure				
Reduction of farmland	Minimise reduction of farmland	Design project to minimise loss of farmland, namely by placing turbines at lot boundaries where possible. Implement Site Reclamation Plan at the end of construction, namely to re-instate initial conditions on temporary areas used during construction. Limit road width during operations to 6 m. Compensate landowners on Project Location as per land lease agreement.	The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Impacts to abutting parcels of land	Avoid impacts to abutting parcels of land	Design Project with setback distance of hub height to lot lines. For turbines under hub height distance to lot lines, prepare a Property Setback Assessment (PSA) and provide measures to minimise impact, if required. Details of the Property Setback Assessment can be found in the reports on this subject as part of the competed REA application package.	The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Stray voltage	No stray voltage events affecting livestock	Project will be built and maintained as prescribed by the Distribution System Code and the Electrical Safety Authority to minimise the risk of stray voltage.	The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
				are applied.
Areas Protected under Provincials Plans and Policies				
N/A				
Public Health and Safety				
Incidents resulting from ice shed	No public health and safety incidents.	Design turbine layout to respect a 20 m setback from any building. Implement Communications Plan namely to inform local community of icing events and place signs in areas with safety concern, when applicable.	The likelihood and magnitude of this residual effect is considered non significant.	Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan). In most cases, turbines automatically shut-down during icing events. Operation of turbine is resumed only after appropriate confirmation of safety.
Radio communication and Radar Systems				
Interference to systems from turbines	Avoid interference to all identified and registered systems	Design turbine layout to avoid radio communication systems (towers and microwave links) as per best practice setbacks. Notify and receive clearance from NavCan, RCMP, GMCO and DND.	The likelihood and magnitude of this residual effect is considered non significant.	The magnitude of the residual effect is considered non significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.

4 REFERENCES

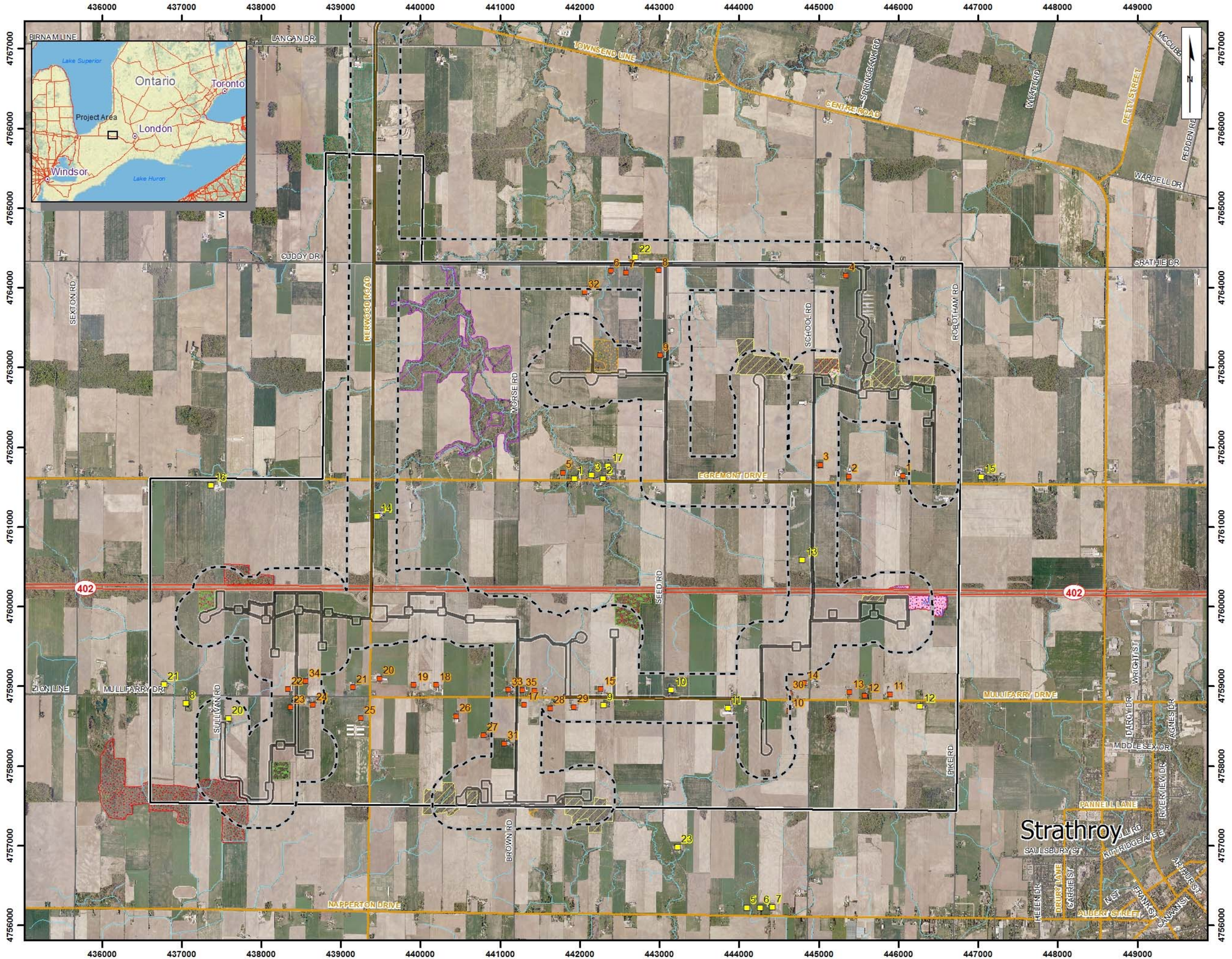
[1] Ontario Regulation 359/09, made under the *Environmental Protection Act*, Renewable Energy Approvals under Part 1.0 of the Act.

[2] Ontario Regulation 521/10, made under the *Environmental Protection Act*, Renewable Energy Approvals under Part 1.0 of the Act.

[3] Technical Guide to Renewable Energy Approvals, Ontario Ministry of the Environment, July 2011.

[4] NRSI, Records Review and Desktop Analysis for the Adelaide Wind Energy Center [sic], August 2011.

APPENDIX A PROJECT LOCATION MAP



NEXTera ENERGY

Adelaide Wind Energy Centre

Project Location
- Map 1 -

GL Garrad Hassan

1009--120215-001-JM

April 24, 2012