Environment

NextEra Energy Canada, ULC

# Final Decommissioning Plan Report – Bluewater Wind Energy Centre

**Prepared by:**

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60155032

**Date:**

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## Glossary of Terms

ABCA ..... Ausable Bayfield Conservation Authority
kV ..... Kilovolt
m ..... Metre
MOE ..... Ministry of the Environment
MNR ..... Ministry of Natural Resources
MW ..... Megawatt
NextEra ..... NextEra Energy Canada, ULC
O. Reg. 359/09 ..... Ontario Regulation 359/09
The Project ..... Bluewater Wind Energy Centre
REA ..... Renewable Energy Approval

# 1. Introduction

Varna Wind Inc., a wholly owned subsidiary of NextEra Energy Canada, ULC (NextEra), is proposing to construct a wind energy centre project in the Municipalities of Bluewater and Huron East in Huron County, Ontario. The project will be referred to as the Bluewater Wind Energy Centre (the "Project") and will be located on private lands in the vicinity of the shoreline of Lake Huron. The wind turbine technology proposed for the Project is the 1.6 MW GE model wind turbine. Although NextEra is seeking a Renewable Energy Approval (REA) for 41 wind turbines, up to 37 are proposed to be constructed for the Project.

This Decommissioning Plan Report was prepared in accordance with the requirements of *Ontario Regulation 359/09 (O. Reg. 359/09)* and the Technical Guide to Renewable Energy Approvals (Ministry of the Environment (MOE), 2011).

The following sections outline the process of the Project's decommissioning phase.

## 1.1 Summary of Decommissioning Report Requirements

The requirements for the Decommissioning Plan Report defined under *O.Reg. 359/09* are provided in the following table (Table 1-1) and in the related report sections.

**Table 1-1 Adherence to Decommissioning Plan Report Requirements**

| Requirement | Completed | Corresponding Section |
|---|---|---|
| **Description of Decommissioning Activities** | Yes | 2.3 |
| **Site Restoration** | Yes | 2.4 |
| **Managing Excess Materials and Waste** | Yes | 2.5 |
| **Other Approvals** | Yes | 2.8 |

## 1.2 The Proponent

The Project will be owned and operated by Varna Wind Inc., a subsidiary of NextEra. NextEra's parent company is NextEra Energy Resources, LLC, a global leader in wind energy generation with a current operating portfolio of over 85 wind energy projects in North America. In Canada, wind energy centres currently owned and operated by NextEra include: Mount Copper and Mount Miller, (both 54 megawatts (MW)) located in Murdochville, Quebec; Pubnico Point, (31 MW) located near Yarmouth, Nova Scotia; and Ghost Pine (82 MW), located in Kneehill County, Alberta.

The primary contacts for the project are as follows:

| Project Proponent | Project Consultant |
|---|---|
| Nicole Geneau<br>Project Director<br>NextEra Energy Canada, ULC<br>5500 North Service Road, Suite 205<br>Burlington, Ontario, L7L 6W6<br>Phone: 1-877-257-7330<br>Email: Bluewater.Wind@NextEraEnergy.com<br>Website: http://www.NextEraEnergyCanada.com | Marc Rose<br>Senior Environmental Planner<br>AECOM<br>300-300 Town Centre Blvd.<br>Markham, Ontario, L3R 5Z6<br>Phone: 905-477-8400 x388<br>Email: marc.rose@aecom.com |

### 1.3 Project Study Area

The proposed Project is located in Huron County, within the Municipalities of Bluewater and Huron East. The Project Study Area consists of the areas being studied for the wind farm components (Wind Energy Centre Study Area), as well as for the interconnection route (i.e., the area being studied for transmission lines to connect the Project to the electrical grid) (Transmission Line Study Area) (Figure 1-1). The Wind Energy Centre Study Area is generally bounded by Blackbush Line/Bronson Line to the west, Mill Road to the north, Concession 5 Road to the east, and Danceland Road/Staffa Road to the south, in the Municipality of Bluewater. The Transmission Line Study Area is located to the east of the Wind Energy Centre Study Area, and is generally bounded by Concession 5 Road to the west, Mill Road to the north, Huron Road and Perth 183 Road to the east, and Staffa Road to the south, extending into the Municipality of Huron East.

The location of the Project Study Area was defined early in the planning process for the proposed wind energy centre, based on the availability of wind resources, 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.

# 2. Decommissioning Plan Overview

The anticipated life of the Project is estimated to be 30 years. The following sections describe how the proposed Project will be dismantled either during construction (although unlikely) or following the operations phase of the Project. The wind turbine decommissioning process will be initiated upon the termination of the leases with the landowners. The decommissioning process will involve removing the wind turbine, including the tower, generator, auxiliary equipment, above ground cables/poles, fixtures, all other personal property and otherwise restoring the premises to its original condition. If it is agreed upon with the landowner, access roads and underground cables may be left in place. Foundations shall be removed to original soil depth or 1 metre (m) below grade, whichever is the lesser, and replaced with topsoil. Within 12 months of initiating the decommissioning process, the Project owner will have removed the relevant components from the leased land.

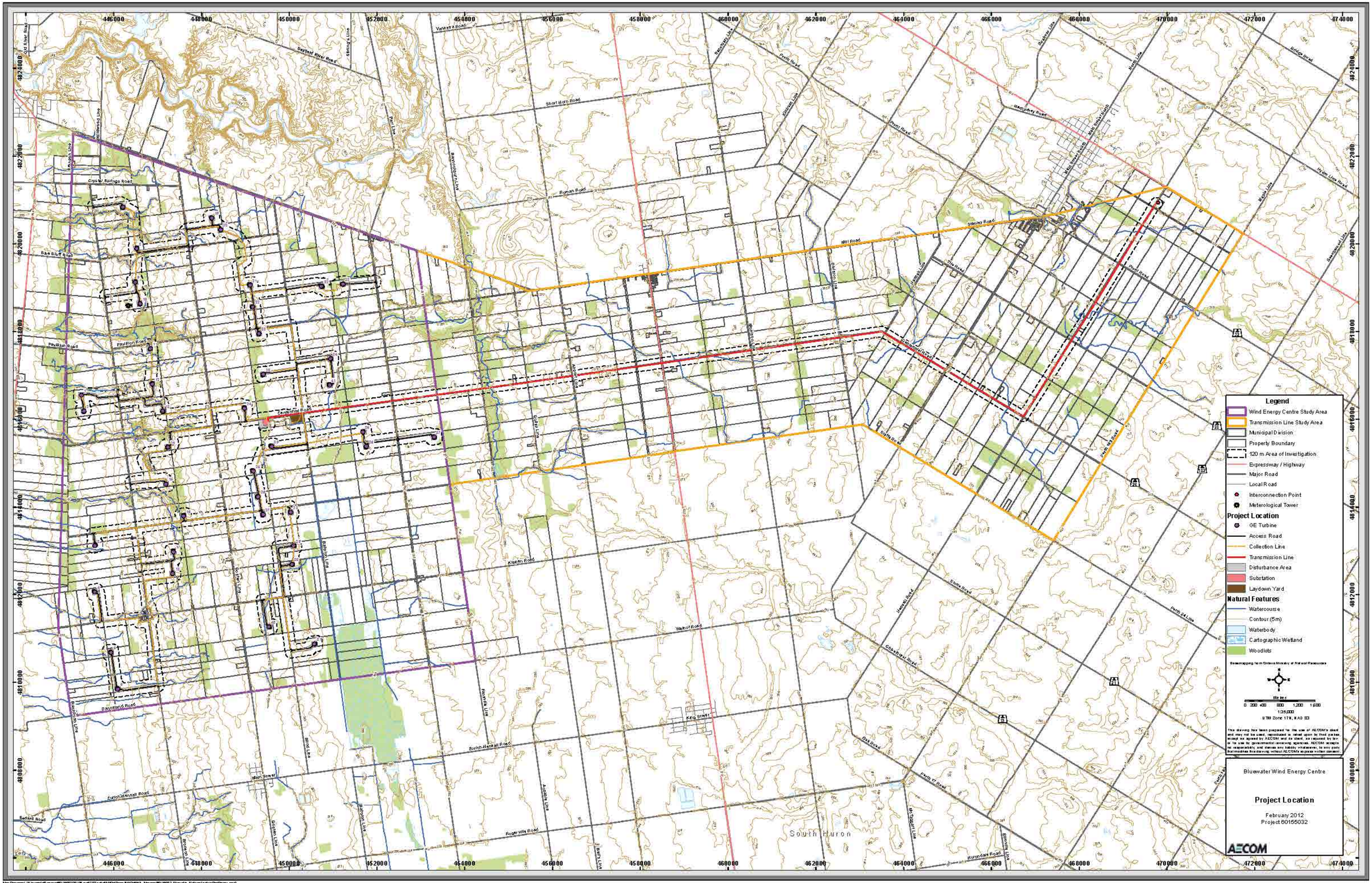
The decommissioning of the Bluewater Wind Energy Centre will be undertaken in compliance with the Ontario Health and Safety Act along with any other applicable regulatory requirements and standards, including those from the Ministry of Natural Resources, Conservation Authorities or Ministry of Tourism, Culture and Sport. As with construction, a manager responsible for safety will be present on site for the duration of the work.

### 2.1 Decommissioning During Construction

Although it is unlikely that the Project would be decommissioned before the operations phase, should this occur, the actual procedures for dismantling the Project would depend upon the state of construction. Dismantling would follow the steps outlined in Section 2.3 of this report and any exposed soils would be re-seeded in consultation with the landowner. Mitigation measures as described in the *Environmental Effects Management Plan* (part of the *Design and Operations Report)* would also be implemented.

### 2.2 Decommissioning After Ceasing Operations

Properly maintained wind turbines have an expected life of at least 30 years. At the end of the project life, depending on market conditions and project viability, the wind turbines may be ‘re-powered’ with new nacelles, towers, and/or blades, thus extending the useful life of the project and delaying any decommissioning activities. Alternatively, the wind turbines may be decommissioned.


Legend
Wind Energy Centre Study Area
Transmission Line Study Area
Municipal Division
Property Boundary
120 m Area of Investigation
Expressway / Highway
Major Road
Local Road
Interconnection Point
Meterological Tower
Project Location
GE Turbine
Access Road
Collection Line
Transmission Line
Disturbance Area
Substation
Laydown Yard
Natural Features
Watercourse
Contour (5m)
Waterbody
Cartographic Wetland
Woodlots
Basemapping from Ontario Ministry of Natural Resources
Metres
0 200 400 800 1,200 1,600
1:35,000
UTM Zone 17N, NAD 83
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Bluewater Wind Energy Centre
Project Location
February 2012
Project 60155032
AECOM
South Huron
Bayfield River Road
Short Horn Road
Roman Road
Vanstone Road
Crystal Springs Road
Blue Bluff Road
Pavillion Road
Centennial Road
Dungannon Road
Zurich-Hensall Road
Bedard Road
Main Street
Mill Road
Stanley Road
Kippen Road
Walnot Road
King Street
Oak Road
Roger Ville Road
Hurondale Road
Glasgow Road
Glasgow Line
Bird Line
Brucefield Line
Dashwood Line
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The following activities for the removal of the components will be undertaken once decommissioning is initiated:

- Remove above-ground collection and transmission system including substation and switchyard;
- Remove wind turbines;
- Partial removal of wind turbine foundations;
- Remove underground cables; and,
- Remove turbine access roads, if required by landowners.

The following anticipated detailed decommissioning plan is based on current procedures and experience. The specifics of these procedures may be adjusted to reflect additional decommissioning experience in the future.

### 2.2.1 Wind Turbines

The first stage of the disassembly will be to have wiring crews disconnect the tower from the collection system and disconnect the wiring between turbine sections. A disassembly crew will then use a crane to remove the blades, the rotor, nacelle and then the towers section by section. The lubricating oil will be drained from the gearbox once it has been placed on the ground, and the oil will be disposed of in accordance with applicable regulations. As the turbine is being disassembled, the various components will be transported off-site.

### 2.2.2 Wind Turbine Foundations

Once all the turbine components have been cleared from a site, the top metre of overburden around the foundation will be excavated and stockpiled. Once cleared, the top 1 m of the foundation (or to bedrock) will be demolished. The resulting concrete and rebar will be hauled off-site and disposed of at a licensed facility. Afterwards, the stockpiled soil will be used to replace the now cleared area. The disturbed area will be feathered out and graded. No off-site soil is predicted to be needed.

### 2.2.3 Access Road Removal

Access roads will be left at the landowner’s request or graded to restore terrain profiles (as much as possible), and vegetated.

### 2.2.4 Cable Wire Decommissioning

At the time of decommissioning, if appropriate, the underground cables will be left in place. The lines will be cut and the ends buried to 1 m below grade.

### 2.2.5 Electrical Substation Decommissioning

The substation electrical components will be either removed as a whole or disassembled, pending reuse or recycling. Once cleared, the gravel around the yard will be reclaimed (unless the landowner wishes to keep the area as is) and the fence removed. As with the turbine foundation, the substation foundation will be excavated and the top 1 m of concrete (or to bedrock) will be demolished and hauled off-site to be disposed of at a licensed facility. The excavated area will then be filled in with native soil and re-graded. Any material that has been used as a sound attenuating berm will be levelled and replanted to the requirements of the landowner.

### 2.2.6 Crane Pad Decommissioning

The crane pad aggregate will be removed and areas will be filled unless the landowner asks for it to remain.

### 2.2.7 Overhead Collector System and Transmission Lines

Overhead cables and transmission poles that are not shared with Hydro One will be removed or sold to an acceptable Transmission/Distribution Operator. Transmission pole holes will be filled with clean fill and disturbed areas will be reseeded with native vegetation, where required. Overhead lines will be removed and recycled, reused, or disposed of in accordance with regulatory requirements at the time of decommissioning.

## 2.3 Procedures for Decommissioning

Decommissioning procedures will be similar to the construction phase and will include:

1. The creation of temporary work areas. In order to provide sufficient area for the lay-down of the disassembled wind turbine components and loading onto trucks, a 122 m by 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 removal of the top 1 m of the turbine foundations and replacement with clean fill and stockpiled topsoil. The fill and topsoil will be contoured to allow cultivation in the case of agricultural lands.
6. Road bedding material will be removed and replaced with clean subsoil and topsoil for reuse by the landowner for agricultural purposes. It is proposed to leave culverts in place following the operations phase.
7. Cutting underground electrical lines, burying the ends to 1 m below grade, and leaving the lines in place. Above-ground lines and poles that are not shared with Hydro One will be removed and the holes will be filled with clean fill.
8. The demolition of the substation and operations building (if the latter was built specifically for the Project). 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.

## 2.4 Restoration of Land and Water Negatively Affected by Facility

Once all of the turbines and ancillary facilities are removed, the remaining decommissioning work will consist of shaping and grading the areas to, as near as practicable, the original contour prior to construction of the wind turbines and access roads. Existing agricultural capacity will be restored and the land re-contoured to maintain proper drainage. All areas, including the access roads, transformer pads and crane pads will be restored to, as near

as practical, their original condition with native soils and seeding. 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, there is the potential through the decommissioning process for small spills of solvents or fuels. The soil conditions of the turbine areas will be surveyed to determine if any impacts have occurred. Should soil impacts be noted, the impacted soils will be identified, excavated, and removed to the 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 none are available, clean fill and topsoil will be imported.

Other than the concrete, which will remain 1 m below the soil or at the depth of the native bedrock, no other residual impacts are foreseen. Decommissioning may temporarily affect the agricultural practices directly around the access roads, substation and turbine locations, but only during their removal. Limited impacts to terrestrial vegetation are expected since all of the Bluewater Wind Energy Centre infrastructure will be located exclusively on agricultural land; however, wildlife, including birds and bats, inhabiting nearby natural features, may be disturbed by decommissioning.

The most significant risk to the aquatic environment will be when the access roads near drains or municipal drain crossings are removed. Similar to the construction phase, decommissioning will follow a stormwater protection plan that will ensure proper steps are followed to mitigate erosion and silt/sediment runoff. This plan will incorporate the best management practices outlined in the Water Assessment and Water Body Report.

As with the Project's construction, noise levels around the decommissioning work will be higher than average. Proper steps will be followed to minimize this disturbance, such as avoiding work outside of daylight hours. All decommissioning project activities will conform to the local municipal noise by-laws where applicable. Also, as with the Project's construction, road traffic in the area will increase temporarily due to crews and heavy equipment movements. If required, a traffic management plan will be prepared to mitigate the effects of increased road traffic, in consultation with the local municipality.

Decommissioning of the wind turbines should not result in any impacts to surface or groundwater quality. After the decommissioning process is completed the land will be returned to existing agricultural conditions.

## 2.5 Procedures for Managing Waste and Materials

As discussed above, the waste generated by the decommissioning of the Project is minimal, and there are anticipated to be no toxic residues. Any waste generated will be disposed of according to the applicable standards with the emphasis on recycling materials whenever possible.

The major components of the wind turbines (tower, nacelle, blades) are modular items that allow for ease of construction and disassembly of the wind turbines during replacement or decommissioning. Dismantled wind turbines have a high salvage value due to the steel and copper components. These components are easily recyclable and there is a ready market for scrap metals. Transformers and transmission lines are designed for a 50 year lifespan so these items could be refurbished and sold for reuse.

Based on the construction details for the GE wind turbines and associated tower and components, it is assumed that both the tower and nacelle will yield approximately 80% salvageable materials. Since the hub assembly and bedplate is manufactured steel, it is anticipated that the hub will yield 100% salvageable metallic materials. Copper salvage estimates were derived by assuming 5% of the total tower and nacelle weight consists of salvageable copper bearing materials. Since the rotor/blades are constructed of predominantly non-metallic materials (fiberglass reinforced epoxy and carbon fibres), no salvage for the rotor or blades is currently assumed.

It is assumed that 75% of the aggregate material from the decommissioning of the crane pads can be salvaged for future use as aggregate base course. The remaining materials would be viable for general fill on non-structural fill areas. The geotextile fabric cannot be salvaged.

### 2.6 Emergency Response and Communications Plan

The *Emergency Response and Communications Plan* is included in the *Design and Operations Report* prepared as part of the REA application for the proposed Bluewater Wind Energy Centre.

### 2.7 Decommissioning Notification

The process for notification of decommissioning activities will be the same as the process for notification of construction activities and is detailed in Section 5 of the *Emergency Response and Communications Plan* in the *Design and Operations Report* prepared as part of the REA application for the proposed Bluewater Wind Energy Centre.

### 2.8 Other Approvals

The Project owner is aware that after the decommissioning of the proposed facility, a Record of Site Condition under the MOE Regulation 153/04, as amended, may be required. The Project owners will ensure that all of the required approvals at the time of decommissioning of the proposed facility are adhered to. Decommissioning the Project may also require the following permits:

- Building or demolition permits obtained by the municipalities
- Approvals from the Ausable Bayfield Conservation Authority.

### 2.9 Conditions of Approval

The Project owner will ensure that the decommissioning stage of the proposed Project is carried out in accordance with REA requirements and the measures/practices as described in this report as well as any conditions imposed in the REA approval.

## 3. Summary and Conclusions

This *Decommissioning Plan Report* has been completed to assist the Project owner in fulfilling regulatory requirements for the decommissioning of the Bluewater Wind Energy Centre project. This report is consistent with the provisions of Ontario Regulation 359/09 for a Class 4 Wind Farm facility.