



Samsung Renewable Energy Inc. and
Pattern Renewable Holdings Canada ULC
4 Decommissioning Plan Report
For
Armow Wind Project



SUMMARY OF REPORT REVISIONS

Summary of Report Revisions

Section of Report	Report Date: August, 2012	Report Date: September, 2012	Report Date November, 2012	Report Date REA Submission November, 2012
Section 2.7.2	SVRCA	Revised: SVCA		
Table 1		Reference to report sections in Table 1: Section 2.2 Section 2.3 Section 2.8	Revised: Section 2.6 Section 2.7 Section 2.8	
Table 2		Project Lifespan (approval to decommissioning)	Revised: Project Lifespan (commercial operation)	
Table 4		Meteorological Towers ■ Unless otherwise requested by Bruce County, the Municipality of Kincardine or local aviation groups (and agreed to by the Proponent) to have them remain in place, the towers will be removed. ■ Once removed, they will be dismantled and components will be reused, recycled, or disposed of in the appropriate facilities. The concrete foundations will be removed completely or to approximately one metre, with soil and soil horizons replaced and reinstated. An annual seed mixture will be used to mitigate soil erosion.	Revised: Meteorological Towers and Microwave Tower ■ Unless otherwise requested by Bruce County, the Municipality of Kincardine or local aviation groups (and agreed to by the Proponent) to have the meteorological towers remain in place, the towers will be removed. ■ Once removed, the meteorological and microwave towers will be dismantled and components will be reused, recycled, or disposed of in the appropriate facilities. The concrete foundations will be removed completely or to approximately one metre, with soil and soil horizons replaced and reinstated. An annual seed mixture will be used to mitigate soil erosion.	



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Section 2.6.9		If it is determined that the meteorological towers need to be removed, they will be dismantled using a crane, and the metal components will be recycled.	Revised: If it is determined that the meteorological towers and/or the microwave tower need to be removed, they will be dismantled using a crane, and the metal components will be recycled.	
General Update			A total of 99 turbines will be permitted to provide contingency positions.	Revised: A total of 98 turbines will be permitted to provide contingency positions.
Section 2.7			Site Restoration of Lands Affected by the Facility	Revised: Site Restoration of Lands and Water Affected by the Facility



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SP ARMOW ONTARIO LP - ARMOW WIND PROJECT

Decommissioning Plan Report

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Golder Associated Ltd. - 1 Copy

REPORT





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FIGURES

Figure 1: Project Location



DECOMMISSIONING PLAN REPORT ARMOW WIND PROJECT

1.0 GENERAL INFORMATION

The Armow Wind Project (the “Project”) is an up to 180 megawatt (MW) commercial wind energy generation facility located substantially on leased privately owned lands in the Municipality of Kincardine, Bruce County, Ontario (see Figure 1, end of the Report). The Project is being developed by SP Armow Wind Ontario GP Inc., in its capacity as general partner of SP Armow Wind Ontario LP (the “Proponent”). The Proponent is a joint venture limited partnership owned by affiliates of Pattern Renewable Holdings Canada ULC (“Pattern”) and Samsung Renewable Energy Inc. (“Samsung”). The Proponent is proposing to develop, construct, and operate the Project in response to the Government of Ontario’s plan to integrate more renewable energy into the province’s power grid.

In 2009, the Government of Ontario introduced the *Green Energy and Green Economy Act* and Ontario Regulation (O. Reg.) 359/09. The regulatory amendments to O.Reg 359/09 came into force on July 1, 2012 as O. Reg 195/12¹. The Renewable Energy Approval (“REA”) integrates previous requirements under the *Environmental Assessment Act* with clear provincial rules and standards in a new regulation under the *Environmental Protection Act*. This Decommissioning Plan Report has been prepared to provide details of the Project as part of the REA.

Table 1, below, highlights the requirements and how they are addressed in this Decommissioning Plan Report.

Table 1: Decommissioning Plan Report Requirements and Information Location

Requirement per O. Reg. 359/09, as amended	Report Section
Procedures for decommissioning during construction (i.e., Project abandonment)	Section 2.1
Procedures for dismantling or demolishing components of the facility	Section 2.6
Activities related to the restoration of any land and water negatively affected by the facility	Section 2.7
Procedures for managing excess materials and waste	Section 2.8

This Decommissioning Plan Report will be provided to Aboriginal communities, the Municipality of Kincardine, County of Bruce and the public following the distribution requirements and timing constraints outlined in O. Reg. 359/09, as amended, and the 2012 Draft Technical Guide to Renewable Energy Approvals (MOE, 2012; MOE, 2012).

¹ All references to Ontario Regulation 359/09 refer to the Regulation as amended Regulation 195/12 which came into force July 1, 2012



1.1 The Project Location

The proposed Project is situated in Bruce County, 3 km from Lake Huron; approximately 2 km northeast of Kincardine, Ontario (see Figure 1).

The Project location, is defined in O. Reg. 359/09, as amended, (in relation to a renewable energy project) to mean “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 proposed to engage in the project”. The Project location is bounded by Highway 21 to the west, Concession 4 to the north, County Road 1 to the east and the North Line to the south. The area encompassed by these boundaries is referred to in this document as the “Project Study Area”.

The proposed Project area, covering approximately 18,800 hectares of land in the Municipality of Kincardine, Ontario, is primarily comprised of agricultural lands with fragmented blocks of forest and riparian areas associated with small creeks and farm drains (see Figure 1). The Project will be located primarily within portions of privately owned lands parcels with collection cables being placed in public road allowances. Portions of privately owned land parcels that contain Project infrastructure will be under lease or easement to the Proponent for the duration of the Project.

The location of the Project was established based on interest expressed by local landowners, its proximity to high-voltage transmission lines, and its excellent wind resource.



DECOMMISSIONING PLAN REPORT ARMOW WIND PROJECT

1.2 Project Vital Statistics

Table 2: Summary of Project Vital Statistics

General

Project Name	Armow Wind Project
Project Ownership and Operation	SP Armow Wind Ontario LP
Project Lifespan (commercial operation)	20 Years
Project Nameplate Capacity	Up to 180 MW

Project Area (as shown in Figure 1)

Location of Project	Privately-owned land and Public Road Allowances Municipality of Kincardine, County of Bruce
Total Project Study Area	18,800 ha
Total Area of Project Location (total disturbance area)	472.9 ha

Wind Turbine Generators

Model	Siemens SWT-2.3-101
Total Number Permitted	98
Approximate Number Constructed	90
Nominal Power	1.8 to 2.3 MW
Number of Blades	3
Blade Length	49 m
Hub Height	99.5 m
Rotor Diameter	101 m
Cut-in Wind Speed	3 m/s
Cut-out Wind Speed	25 m/s
Rated Wind Speed	12 – 13 m/s
Swept Area	8,000 m ²
Foundation Dimensions	20 m in diameter

Access Roads

Operation Roads (includes shoulder, travel width and ditch)	58 km x 4-8 m
Construction Roads (with shoulder)	58 km x 7-15 m
Temporary Roads / Crane Walks	3.22 km x 7-15 m

Collector Lines

34.5 kV Collector Lines in public ROW (total combined length of proposed underground and/or overhead)	132 km x 2-6 m
34.5 kV Collector Lines on private lands (underground)	60 km x 2-6 m

Other Project Structures and Facilities

Collector Substation	200 m x 150 m
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DECOMMISSIONING PLAN REPORT ARMOW WIND PROJECT

General

Operations and Maintenance Building	50 m x 30 m
Point of Interconnect	1 acre

Temporary Land Use (Construction Phase)

Construction Staging Area	10 acres
Wind Turbine Laydown Area (each turbine)	5000 m ²
Crane Pads	40 m x 20 m

1.3 Contact Information

Applicant

The proponent for the Project is SP Armow Wind Ontario LP, by its general partner SP Armow Wind Ontario GP Inc. The Proponent is a joint venture limited partnership owned by affiliates of Pattern Renewable Holdings Canada ULC and Samsung Renewable Energy Inc. The contacts for the Project are as follows:

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Toronto, ON M5H 3G2
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Consultant

The Proponent has retained Golder Associates Ltd. (Golder) to prepare an REA Application under O. Reg. 359/09, as amended. Contact information for the Golder Project Manager is as follows:

Ian Callum, Project Manager
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Project

Project email: info@armowwind.com
Project website: www.armowwind.com



2.0 DECOMMISSIONING

Following the anticipated 20 year operational phase of the Project, all components are expected to be decommissioned as described in Section 2.2. In the unlikely event that Project development is halted during construction, the strategies for decommissioning the Project under these circumstances are described in Section 2.1.

In determining the probable future use for the Project there are two primary factors to consider, namely: economic factors and technological factors. If an economic evaluation determines that repowering the Project by replacing and/or upgrading Project components is possible then, through consultation with participating landowners and other stakeholders, extending the lifespan of the Project may be considered. Any evaluation of repowering the Project will also consider any technological improvements that have been developed during the proposed 20 year operational phase of the Project. If the Proponent makes the decision to decommission the Project in lieu of replacing and/or upgrading Project components then the most probable future land use is agricultural. As previously noted the proposed Project is located primarily on agricultural lands and therefore following the decommissioning of the Project lands will be restored so that agricultural activities can continue.

2.1 Decommissioning During Construction (Abandonment of Project)

In the event that construction and installation of the Project is halted and subsequently not completed for any reason, the Proponent will be responsible for removing any equipment or infrastructure that is already installed, and removing all construction waste, following procedures discussed in Sections 2.2 and 2.4.

2.2 Potential Effects

Should the Project be abandoned during the construction and installation activities, the Proponent will be responsible for implementing environmental protection measures to mitigate any potential negative effects of these decommissioning activities. The extent of environmental protection measures required will be dependent on the development progress made at the time the Project is abandoned. Potential environmental protection measures may include filling exposed excavations, erosion and sediment control, and the replacement of topsoil and/or vegetation where required. Any disturbed field drains or tiling that was present at the commencement of construction will be repaired or replaced to restore field drainage and return the area to the previous land use (typically agriculture). The condition of the disturbed areas will be discussed with individual landowners to address any potential concerns. As some conditions may not be apparent for weeks or months following Project abandonment, the Proponent will maintain the Project public contact number and information for a minimum of one year following abandonment and will respond to landowner concerns via this method or by an on-site visit. Decommissioning during Project construction and installation activities will not involve any equipment that would differ from standard decommissioning activities (Section 2.2).



2.3 Mitigation Strategy

Following construction best management practices, stockpiles of soil will be covered with tarps, plastic sheeting or other Best Management Practices (BMP) deemed necessary during work stoppages to prevent erosion, runoff and fugitive dust emissions. Vegetation removal adjacent to water bodies will be minimized to the extent agreed to by the MNR or Saugeen Valley Conservation Authority (SVCA), and will be avoided wherever possible to reduce potential sedimentation of watercourses. Silt fencing, through consultation with the SVCA, will be constructed on the closest edge of the construction area from watercourses and wetlands where works are performed within or adjacent to SVCA's Regulated Area. If the Project is abandoned during construction, the land will be re-graded to the original or otherwise effective grade to allow for natural surface drainage.

Once construction and installation activities cease, excavated soil will be replaced to restore the original soil horizons and land uses. If subsoil has become compacted, it will be ripped. Moderately compacted soils will be ploughed. Areas with disturbed soils or areas that are re-graded with topsoil will be re-seeded with an annual seed mix to help temporarily stabilize the soil and prevent erosion. Any disturbed field drains or tiling that was present at the commencement of construction will be repaired or replaced to restore field drainage and return the area to the previous land use (typically agriculture). The condition of the disturbed areas will be discussed with the landowner to address any potential concerns.

The mitigation strategy will not differ from the mitigation strategies used during construction and installation activities. Restoration of the Project area would follow the procedures outlined in the Construction Plan Report for post-construction activities of the Project (see Construction Plan Report).

2.4 Monitoring Plan and Contingency Measures

The proposed mitigation strategies as outlined above are deemed sufficient to control any potential negative environmental effects from decommissioning activities in the event that Project was abandoned during construction. As such, no monitoring plans are proposed following the conclusion of restoration and reclamation activities. As discussed, the Proponent will maintain the Project public contact number and information for a minimum of one year following abandonment and will respond to landowner concerns via this method or by an on-site visit should conditions become apparent after decommissioning activities have concluded. Refer to the Design and Operations Report for information relating to communication plans.

2.5 Decommissioning After Ceasing Operation

The Project is anticipated to be in operation for 20 years. Following the operational term of the Project, a decision will be made by the Proponent whether to refurbish and extend the operational life of the Project or to decommission. This section describes the activities that will be completed to restore the Project location to an acceptable condition for its intended use if the decision is made to decommission the Project.

Many of the activities completed during decommissioning are similar to those completed during construction and installation activities, but would likely occur in reverse chronological sequence. Preliminary decommissioning activities will include equipment delivery, topsoil removal, and the creation of temporary staging and laydown areas (including field offices). For a detailed description of these activities, refer to the Construction Plan Report.



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A summary of the general timing of Project decommissioning is provided in Table 3. This summary is based on the assumption that the operational lifespan of the Project is 20 years. Decommissioning is expected to span approximately eight months. The decommissioning schedule was produced to account for minor delays that could result from an extended regulatory process, delayed equipment arrival and potentially adverse weather conditions.

Table 3: Timing of Project Decommissioning Activities

Project Phase and Activity	Duration*
<i>Decommissioning Planning and Permitting</i>	
Planning and permitting	■ 1 year
<i>Aboveground Structure Decommissioning</i>	
Turbines including dismantling and removal	■ 5 months
Overhead collector system and transmission lines including dismantling and removal	■ 2 months
Transforming substation and switchyard area including dismantling and removal	■ 2 months
Operations building, including dismantling and removal	■ 2 months
Access roads including deactivation, road bed removal and land reclamation	■ 2 – 3 months
Meteorological towers including dismantling and removal	■ 3 weeks per tower
Watercourse crossings including removal and aquatic and riparian habitat reclamation	■ 1 – 2 weeks per crossing
<i>Belowground Structure Decommissioning</i>	
Turbine foundation removal (including concrete removal to operable depth for agriculture), transport and disposal of materials to suitable facility	■ 4 months
Underground collector lines will be terminated at connection points and removed to 1 m below surface	■ 2 months

*Note: Some decommissioning activities will be completed concurrently and the outlined durations are approximate



2.6 Project Component Dismantling and Removal

At the end of the Project's operational life, all components will be shut down and isolated from external electrical lines. Temporary staging and laydown areas will then be constructed and all decommissioning activities will be carried out within these designated areas. During decommissioning activities, erosion and sedimentation control measures that are consistent with industry best management practices (BMPs) will be implemented.

Delivery of decommissioning equipment and transportation of dismantled Project components from the Project area will utilize Bruce County, Municipality of Kincardine, and provincial roads. If a traffic management plan is required by local governments (Municipality and/or County), such a plan will be prepared by the Proponent in consultation with local governments. The decommissioning contractor would oversee the implementation of the traffic management plan during the Project decommissioning phase, which may include measures such as signage, road closures, speed restrictions, truck lighting, dust control, load restrictions and equipment inspections. The decommissioning contractor following consultation with Bruce County, Municipality of Kincardine and the Ministry of Transportation (MTO), as required, will ensure that road damage and traffic congestion are avoided where possible and suitable repair and mitigation measures are in place.

2.6.1 Aboveground and Underground Structure Decommissioning

Table 4 summarizes the activities that will be completed during decommissioning of aboveground and underground structures. A more detailed description of these activities is described in the following sections.



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Table 4: Project Decommissioning Activities for Aboveground and Underground Structures

Activity	Description
Turbine Dismantling and Removal	■ A crane pad and wind turbine laydown area will be constructed at each turbine location to accommodate the dismantling of the wind turbine generators. ■ Wind turbines will be dismantled into their component parts, including the hub, nacelle, blades, tower and pad-mounted transformers. ■ Before directing components to disposal or recycling facilities, efforts will be made to reuse equipment and salvage parts for existing wind farms with similar turbine technology. ■ Turbine components will be delivered to the appropriate landfill, scrap metal yard or industrial recycling areas by large truck and trailer combinations, requiring approximately 10 – 12 loads per turbine. The total number of loads may decrease substantially if the materials are considered to be scrap and can be reduced to a smaller than original size (e.g., cutting turbine blades into pieces).
Wind Turbine Foundations	■ Foundations, including any rebar or steel anchor bolts, will be removed to a depth of approximately 1 m below grade, so that agricultural activities can continue following soil restoration. ■ Excavated foundation areas will be backfilled with subsoil and topsoil to match the original soil horizons and elevation, and the area will be graded and contoured.
Pad Mounted Transformers	■ Pad mounted transformers will be detached from the base of each wind turbine generator and foundation by a small crane. ■ If possible, the pad mounted transformers from the Project will be recycled for future use.
Wind Turbine Access Roads	■ Following, decommissioning of select Project components, the granular base material and crushed gravel used to construct access roads will be removed from the site by dump truck and delivered to a final destination. ■ Culverts installed during construction and installation activities will also be removed if requested by landowners. Any removal of culverts will be completed in consultation with, and will received approval from the Saugeen Valley Conservation Authority (SVCA), Ministry of Natural Resources (MNR), the Municipality of Kincardine, and the Department of Fisheries and Oceans Canada (DFO), if required.
Overhead and Underground Collector Lines	■ Overhead cables and transmission poles that are not shared with Hydro One or other utilities will be removed. ■ At the connection points, where the underground collector lines come to the surface, the collector lines will be cut and excavated to a depth of approximately 1 m below grade.
Collector Substation and switchyard area	■ The substation and switchyard area facilities will be dismantled and removed in accordance with Provincial regulatory requirements at the time of decommissioning.



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Activity	Description
Operations Building	■ Appropriate use or disposal of the building will be determined at time of decommissioning through consultation with the Municipality of Kincardine and the landowner.
Meteorological Towers and Microwave Tower	■ Unless otherwise requested by Bruce County, the Municipality of Kincardine or local aviation groups (and agreed to by the Proponent) to have the meteorological towers remain in place, the towers will be removed. ■ Once removed, the meteorological and microwave towers will be dismantled and components will be reused, recycled, or disposed of in the appropriate facilities. The concrete foundations will be removed completely or to approximately one metre, with soil and soil horizons replaced and reinstated. An annual seed mixture will be used to mitigate soil erosion.

2.6.2 Wind Turbine Dismantling and Removal

Consistent with the approach detailed in the Construction Plan Report, a crane pad and wind turbine laydown area will be constructed at each turbine location to accommodate the dismantling of the wind turbine generators. Crane pads will be removed following the dismantling of each wind turbine generator and the area will be restored so that agricultural activities can continue.

Wind turbine generators will be dismantled into their component parts, including the hub, nacelle, blades, tower and pad-mounted transformers. Dismantling procedures for the wind turbine generators will be carried out in reverse order of those described during the construction and installation process (see the Construction Plan Report). Equipment required for decommissioning of wind turbine generators will include cranes, machinery required to construct roads and crane pads, light-duty trucks, flatbed trucks, and trailers.

Wind turbine generator components will be stored in the temporary laydown area prior to removal unless an industrial scrap materials company can transport these materials directly from the site, or if there are delays attributed to bad weather or other unforeseen circumstances. Prior to directing wind turbine generator component parts to disposal or recycling facilities, efforts will be made to reuse equipment and salvage parts for existing wind farms with similar turbine technology. Wind turbine generator components will be delivered to the appropriate landfill, scrap metal yard or industrial recycling areas by large truck and trailer combinations.

2.6.3 Wind Turbine Foundations

Wind turbine foundations, including any rebar or steel anchor bolts, will be removed to a depth of approximately 1 m below grade, so that agricultural activities can continue following soil restoration. Excavators mounted with hydraulic hammers and/or hydraulic shears will be used to break up and remove sections of the foundation, and removed concrete will be crushed using a mobile crushing unit before being loaded in dump trucks for removal from the Project area. Excavated foundation areas will be backfilled with subsoil and topsoil to match the original soil horizons and elevation, and the area will be graded and contoured.



2.6.4 Pad Mounted Transformers

Pad mounted transformers will be detached from the base of each wind turbine generator and foundation. A small crane will be used to lift the transformer onto a flatbed truck for removal from the Project area. If possible, the pad mounted transformers from the Project will be recycled for future use.

2.6.5 Wind Turbine Access Roads

Following the decommissioning of select Project components (including wind turbine generators, collector substation, operations and maintenance building, and collector lines), access roads will be removed and lands will be restored so that agricultural activities can continue. Any removed/stored topsoil will be replaced and additional clean topsoil will be used to fill remaining areas. All disturbed areas will be re-graded to allow the landowner to continue with agricultural processes.

Granular base material and crushed gravel used to construct access roads will be removed from the site by dump truck and delivered to a final destination as discussed in Section 2.4.2. At the request of landowners, all or portions of wind turbine access roads will be left in place for future use by landowners.

Culverts installed during construction and installation activities will also be removed if requested by landowners. Any removal of culverts will be completed in consultation with the Saugeen Valley Conservation Authority (SVCA), Ministry of Natural Resources (MNR), the Municipality of Kincardine, and the Department of Fisheries and Oceans Canada (DFO), where required.

2.6.6 Collector Lines

Following current industry practices, underground collector lines on private lands and Municipal right-of-ways will be left in place. It is anticipated that the cut underground cables will have no adverse effects on the soil, environment or cultivation practices since the cut cables will be inert, contain no materials known to be harmful to the environment and will be well below the cultivatable depth for agricultural activities. This will avoid disturbing large areas of agricultural land, in comparison to the areas that would be disturbed and potential environmental effects, if the cables were removed completely.

At the connection points, where the underground collector lines come to the surface, the collector lines will be cut and excavated to a depth of approximately 1 m below grade. Any removal of underground collector lines will be carried out in consultation with landowners and in accordance with land lease agreements. Any collector lines located at directionally drilled watercourse crossings will remain in place; however the connection point will be severed at a point located outside of the SVCA's Regulated Area.

Overhead collector lines and monopoles that are not shared with another utility company will be removed if necessary. Holes remaining following the removal of any monopoles will be filled with clean fill and disturbed areas will be reseeded as required. In areas where overhead collector lines are mounted on shared-use monopoles, only the collector lines associated with the Project will be removed. Overhead collection lines will be removed from the Project area and recycled, reused or disposed of in accordance with regulatory requirements at the time of decommissioning.



2.6.7 Collector Substation

The collector substation, control building, electrical components and associated infrastructure will be dismantled and decommissioned in accordance with Provincial regulatory standards at the time of decommissioning.

The entire area will have the subsoil ripped to alleviate compaction, and topsoil will be replaced with clean fill. Soil management will include soil testing for contaminants in accordance with regulatory requirements at the time of decommissioning. If a concrete foundation is used for the substation, it will be removed to approximately 1 m below grade by excavators mounted with hydraulic hammers and/or hydraulic shears. The concrete will be broken up and crushed using a mobile crushing unit before being loaded in dump trucks for removed from the site. All concrete material will be recycled, where possible, or disposed off-site at an approved and appropriate facility. All disturbed areas will be graded, contoured and will be reseeded with crops or other vegetation, if requested.

2.6.8 Operations and Maintenance Building

An appropriate use or disposal of the building will be determined at time of decommissioning through consultation with the Municipality of Kincardine and the landowner. If required to be dismantled, all materials will be removed from the Project area for reuse, recycling or disposal. Gravel will be removed and sold or delivered to the local waste management facility.

The entire area will have the subsoil ripped to alleviate compaction, and topsoil will be replaced with clean fill. Soil testing for contaminants will be conducted in accordance with regulatory requirements at the time of decommissioning. The area will be re-graded and restored to pre-facility conditions.

2.6.9 Meteorological Towers and Microwave Tower

The three proposed meteorological towers that will be used for monitoring during the life span of the Project will be left in place to be used by the Municipality of Kincardine, Bruce County or local aviation groups, if agreed upon by the Proponent. If it is determined that the meteorological towers and/or the microwave tower need to be removed, they will be dismantled using a crane, and the metal components will be recycled. All components not able to be recycled will be delivered to an appropriate scrap yard. The concrete foundations will be removed to approximately one metre, with soil and soil horizons replaced.

2.7 Site Restoration of Lands and Water Affected by the Facility

The proposed Project area encompasses approximately 18,800 ha of land, and as of 2012 is primarily comprised of agricultural lands with fragmented blocks of forest and riparian areas associated with small creeks and farm drains. The proposed Project will be located primarily within portions of privately owned lands parcels, with segments of overhead/underground collection lines placed in public road allowances. Additional information on the Project Study Area and pre-construction state is provided in the Project Description Report and Natural Heritage Assessment Report.

To the extent possible, restoration activities in the Project area will occur immediately following the decommissioning of Project components. The Proponent's objective is to restore the lands affected by the



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proposed facility to pre-disturbance conditions. As the majority of the Project Study Area is primarily comprised of agricultural fields, the following site restoration activities will consider:

- Original soil horizons, soil types and nutrient content;
- Potential for soil contamination occurring during the Project and need for soil contaminant testing;
- Erosion and sedimentation control strategy, and other Best Management Practices; and
- Size and type of infrastructure being removed (magnitude of environmental effects).

2.7.1 Agricultural Lands

Where the Project location is situated in agricultural areas, lands will be restored to allow agricultural activities to continue. Agricultural lands will become compacted as a result of Project operation and decommissioning activities. Examples of Project operation and decommissioning activities that will result in land compaction include the use of wind turbine access roads, temporary staging and laydown areas, and crane pads. Options to de-compact affected lands include deep tillage and chisel ploughing, which will be selected in consultation with landowners. Subsoil and topsoil will be replaced on lands where soil was removed for decommissioning activities. The subsoil in these areas will be re-graded to maintain natural surface drainage patterns where possible. Where topsoil is required to ensure that land depth is consistent with surrounding areas it will be sourced as certified clean fill and will match the existing soil types as closely as possible.

Any capped or damaged tile drains will be replaced by a licensed contractor to ensure appropriate drainage of the farmland. It is assumed that each landowner will continue their desired agricultural management practices and plant their desired crop during the next planting season post-decommissioning.

2.7.2 Water Resources

Decommissioning activities occurring in the vicinity of watercourses or aquatic habitat will be completed in consultation with the SVCA. Mitigation and environmental monitoring procedures in these areas is anticipated to be similar to those described in the Construction Plan Report.

Where landowners request the removal of culverts, the SVCA, MNR, and DFO will be consulted as required. Following the removal of any culverts, the banks and channel bed will be contoured to match the upstream and downstream grade. Native riparian vegetation will be planted to replace any riparian vegetation disturbed during decommissioning activities to prevent erosion and promote proper riparian function. Any underground watercourse crossings required for collector lines will remain in place after decommissioning activities in order to avoid disturbance to watercourses that would likely occur if collector lines were removed.

2.7.3 Spills

Accidental spills or releases of contaminants (i.e., fuel, lubricating oils and other fluids) may occur during the refuelling, operation, or maintenance of decommissioning equipment. In the event that any ground or soils are contaminated, the impacted soils will be removed and disposed of at a Ministry of the Environment (MOE) approved facility. Removed soils will be replaced with fill that matches the existing soil types as closely as possible. For more information regarding spill mitigation, please refer to the Natural Heritage Assessment and the Water Assessment and Water Body Report.



2.7.4 Cultural Heritage Resources

Following Sections 19 – 23 of O. Reg. 359/09, as amended, for archaeological and built heritage resources within 250 m of the Project location, potential effects will be identified and assessed and permission from the appropriate authority (i.e., County, Ontario Heritage Trust and/or the Ministry of Tourism, Culture and Sport (MTCS)) will be obtained prior to construction of the Project. All previous archaeological assessment reports produced for the Project Location will be consulted to see if any sites with outstanding Stage 3 or Stage 4 archaeological assessment recommendations will be impacted during decommissioning activities. If any known archaeological resources are to be impacted during decommissioning activities then appropriate mitigation measures will be assessed, which depending on the resource, could include any of the following:

- Preservation *in situ*; and
- Further assessment (i.e., Stage 3 Archaeological Assessment and possibly Stage 4 Archaeological Assessment).

Details of any archaeological investigations will be summarized in a report for submission to the MTCS for review and acceptance into the Ontario Public Register of Archaeological Reports. If any previously undocumented archaeological sites are encountered during the course of decommissioning activities, a licensed archaeologist will be retained to assess those sites and further mitigation results will be determined at that time.

A review of available cultural heritage information and a site visit (if required) will be completed prior to the start of decommissioning activities to determine if any additional assessments are required. All details of any investigations of protected properties and/or cultural heritage resources will be summarized in a report for submission to the MTCS for review and approval. By following the appropriate mitigation measures, no significant adverse effects on protected properties or archaeological and heritage resources are anticipated during the decommissioning of the Project.

2.7.5 General

In land areas disrupted by decommissioning activities that are not agricultural, re-vegetation will utilize native plant species or agronomic mixes acceptable to the SVCA or MNR. Re-vegetation success and potential for soil erosion may be affected by the timing (season) of planting; therefore, a cover crop or sheeting may be used temporarily to minimize the risk of erosion until appropriate weather conditions permit re-vegetation.

The only materials from Project components that will remain in the Project area following decommissioning activities will be the portion of wind turbine foundations approximately 1 m below grade, and underground collector lines approximately 1 m below grade. The remaining portions of wind turbine foundations and underground collector lines are not anticipated to have any negative environmental effects because they will be inert, contain no materials known to be harmful to the environment, and will be at a depth that will not interfere with agricultural activities.

2.8 Managing Excess Materials and Waste

The majority of materials, including components of wind turbine generators, may be reused, thereby minimizing the amount of waste expected as an outcome of decommissioning. Methods for disposal of excess materials



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and waste will follow Provincial regulatory requirements at the time of decommissioning. Materials that are able to be reused by the Proponent at other Project locations, or that can be sold as is, will be stored at a temporary staging location within or near the Project area prior to delivery to their final destination.

2.8.1 Toxic/Hazardous Materials

Machinery used to dismantle and remove Project components will require oils, fuels and lubricants. In addition, waste lubricants will be recovered during the dismantling of Project components, including the collector substation, wind turbine generators, and operations and maintenance building. These materials will be disposed of through conventional waste-oil and hazardous waste disposal streams in a manner outlined by Bruce County, Municipality of Kincardine and the MOE, if required at the time of decommissioning.

The overhead collector lines required for the Project will be constructed on a monopole structure that is similar to existing electrical distribution lines in the Project Study Area. Typically, these wooden pole structures utilize a chemical-treated exterior. The Proponent will discuss the recycling of wooden poles with a licensed facility, which would likely involve stripping the chemically-treated exterior, disposing of this chemically-infused wood in a landfill, and re-milling the remaining wood core for alternative end uses.

2.8.2 Non-hazardous Waste

Non-hazardous waste, such as plastics, building materials, demolition debris and road gravel may be crushed (as required) and sold to private companies or recycling facilities for reuse where possible, or may be disposed of at the nearest local landfill licensed to receive these materials. Metals and other structural materials from dismantled Project components (e.g., collector substation, operations and maintenance buildings, wind turbine generators, collector lines) may be sold to a licensed scrap metal facility. At present, dismantled wind turbine generators have a high salvage value, as steel and copper components are easily recycled and there is a ready market for these scrap metals. Non-metal components of wind turbines are primarily fibreglass and plastic that will be sold to recycling facilities or crushed and disposed of in the local landfill. By the time of Project decommissioning, local recycling facilities may have the ability to mechanically or thermally recycle turbine blades. Pad-mounted transformers as well as the collector substation transformer(s) are designed for a lifespan of approximately 50 years. As such, these transformers represent an example of Project components that could be refurbished at a licensed facility and sold for reuse.

The local landfill in Armow (the Kincardine Waste Management Centre) is scheduled to open in two stages, with the first stage opening in November 2011. Once completed, the Kincardine Waste Management Centre is expected to have a design capacity of 640,000 m³ (Patterson 2009). If this waste management centre is unable to handle the quantities of waste generated by the Project, the Proponent will consult with local Municipalities to determine another suitable facility or facilities. Identification of the status of these and alternative facilities will be determined during the planning stages of decommissioning and will be discussed with applicable agencies.



3.0 EMERGENCY RESPONSE AND COMMUNICATIONS PLAN

A detailed description of the emergency response plan to address concerns during the operations of the Project is described in the Design and Operations Report. Where applicable, the emergency response plan will also be implemented during the decommissioning of the Project. The emergency response plan developed by the Proponent will be discussed with Bruce County emergency services, the Municipality of Kincardine and Bruce County to ensure that it is amenable to all parties.

The communications plan outlined in the Design and Operations Report includes details on providing regulatory agencies, Bruce County, the Municipality of Kincardine, local residents and Aboriginal communities with Project notifications. In addition the communications plan includes details on receiving communications from the public and stakeholders, including a complaint response protocol. During the decommissioning of the Project the communications plan will be utilized to inform stakeholders on activities being undertaken in the Project area. In addition, the communications plan will outline how stakeholders are able to contact the Proponent and any firm(s) contracted to complete decommissioning activities, as well as the means by which communications will be logged, tracked, and addressed. Please refer to the Design and Operations Report for information relating to the Communications Plan.



4.0 DECOMMISSIONING NOTIFICATION

The process for notifying the public, Aboriginal communities and Bruce County of decommissioning activities occurring in the Project area will follow procedures outlined in the Design and Operations Report. Decommissioning notifications may be distributed in the form of published notices, letters, direct communication, or updates on the Project or Proponent website.



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5.0 OTHER DECOMMISSIONING RELATED APPROVALS

Approvals other than REA may be required specifically for decommissioning activities. Additional permits may also be required from DFO, MNR, MOE and the SVCA. Table 5 indicates some of the authorizations and approvals that may be required at the time of decommissioning based on current regulatory expectation for disposal or recycling of Project components and associated waste materials. The summary provided in Table 5 may not include all possible regulatory requirements for Project decommissioning, however all authorizations and permitting will be obtained in accordance with regulatory requirements at the time of decommissioning.

Table 5: Summary of Potential Decommissioning Permits and Approvals

Permit / Authorization	Administering Agency	Rationale
Entrance Permit	Municipality and County	Ingress/egress from Municipal roads
Building Permit	Municipality	Compliance with Ontario Building Code
Municipal Consent, Work within the R.O.W	Municipality and County	Required for work in municipal road allowances
Road Cut Permit	Municipality	May be required for access roads off of county roads or works to county roads
Transportation Plan	Municipality and County	Adherence to road safety and suitability
Record of Site Condition	MOE	Predicted change in land use from industrial/commercial to agricultural
Land-Use Permit	MTO	Project works undertaken within 180m of an MTO controlled intersection
Change of Access & Heavy / Oversize Load Transportation Permit	MTO	Compliance with provincial highway traffic and road safety regulations
Special Vehicle Configuration Permit	MTO	Use of non-standard vehicles to transport large components
Notice of Project	Ministry of Labour	Notification to the Ministry of Labour before construction begins
Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, Ontario Regulations 169/06	Saugeen Valley Conservation Authority / MNR	Work within floodplains, water crossings, river or stream valleys, hazardous lands and within or adjacent to wetlands (work within Saugeen Valley Conservation Authority's Regulated Area)
<i>Fisheries Act</i> Letter of Advice or Authorization	SVCA under Level 2 Agreement with DFO	Potential direct or indirect effects to fish habitat as defined under the <i>Fisheries Act</i> .
Endangered Species Act	MNR	Potential disturbance to regulated species or habitats within Project Location.



6.0 REFERENCES

Bruce County. 2006. County of Bruce Official Plan. Office Consolidation. January 2006.

Government of Ontario. 2009. Ontario Bill 150, Green Energy and Green Economy Act. May 14, 2009.

Ministry of the Environment (MOE). 2012. Ontario Regulation 359/09. Renewable Energy Approvals under Part V.0.1 of the Environmental Protection Act.

Ministry of the Environment (MOE). 2012. Draft Technical Guide to Renewable Energy Approvals. URL: <http://www.ebr.gov.on.ca/ERS-WEB> External/displaynoticecontent.do?noticeId=MTE2MTA3&statusId=MTczODEx. Accessed: April 2012.

Patterson, Troy. 2009. Armow landfill project to extend usage 38 years. The Kincardine News. Article ID# 1703507. Accessed from <http://www.kincardineneews.com/ArticleDisplay.aspx?e=1703507&archive=true> on December 1, 2011.



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Report Signature Page

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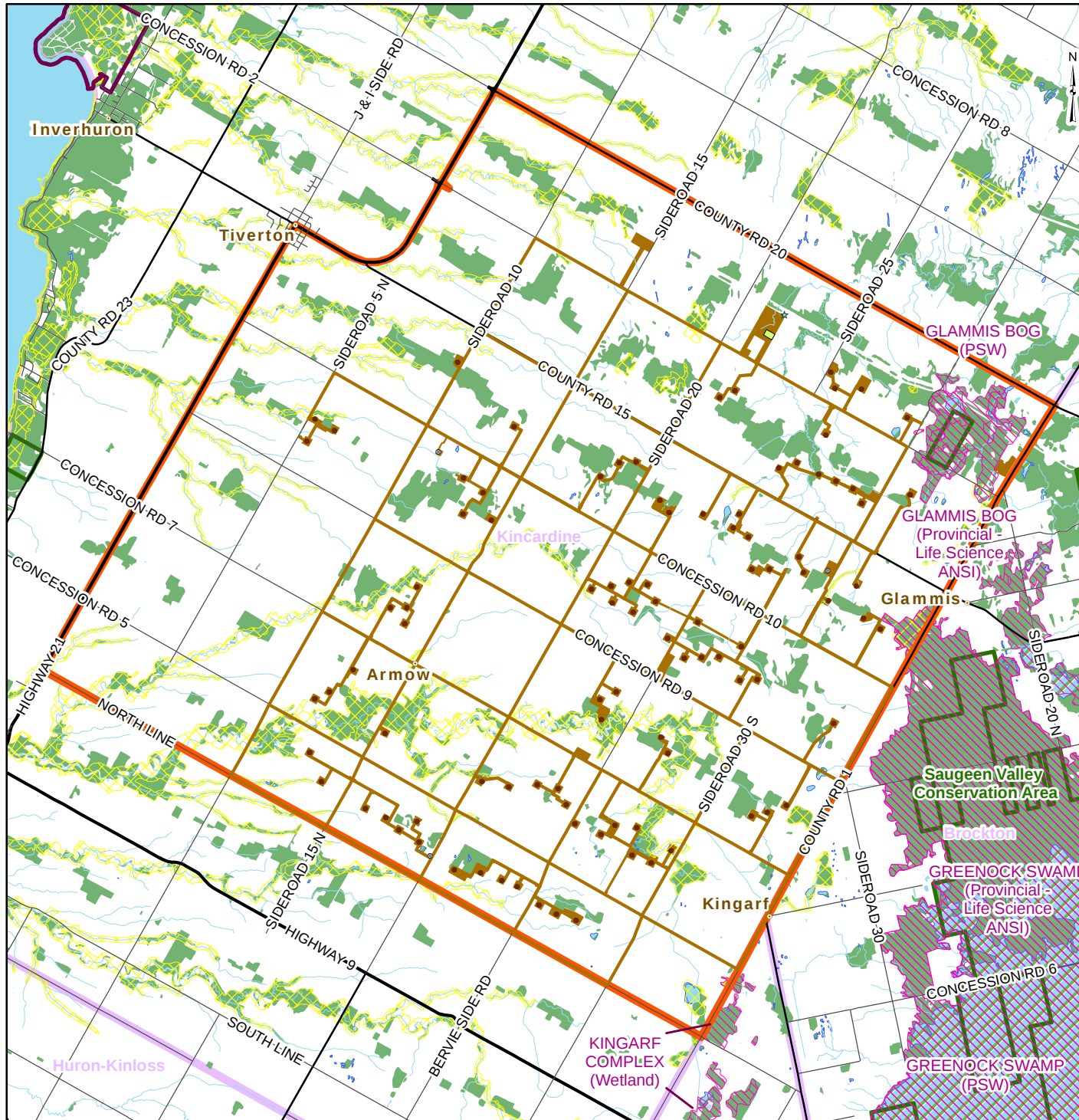
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FIGURE 1

Project Location

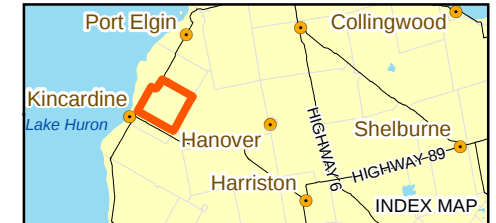


LEGEND

- Turbine
- MET Tower
- Point Of Interconnect (POI)
- Community
- Railway
- Highway
- Major Road
- Local Road
- Watercourse
- Project Study Area
- Project Location
- Substation
- Provincial Park
- Conservation Area
- Natural Feature
- Kincardine Hazard Land
- Wetland
- Waterbody
- Wooded Area
- Municipal Boundary

NOTES:

All potential project collector routes are shown on this figure, final design will likely reduce overall footprint.



REFERENCE

- Base Data - MNR LIO, obtained 2009
 - Natural Features compiled by Golder from NRVS base data, NHIC Natural Areas and MNR Wetland and ANSI data, obtained 2010
 - Hazard Lands - Bruce County, obtained 2010
- Produced by Golder Associates Ltd under licence from Ontario Ministry of Natural Resources, © Queens Printer 2010
Projection: UTM Datum: NAD 83 Coordinate System: UTM Zone 17



PROJECT	ARMOW WIND PROJECT		
TITLE	PROJECT LOCATION		
 Mississauga, Ontario	PROJECT NO. 11-1151-0247	SCALE AS SHOWN	REV.
	DESIGN ME 23 Jul 2012		
	GIS ME 15 Nov 2012		
	CHECK KM 15 Nov 2012		
	REVIEW IC 15 Nov 2012		

FIGURE: 1

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