Appendix D

Environmental Effects Monitoring Plan for Wildlife

AMHERST ISLAND WIND ENERGY PROJECT

ENVIRONMENTAL EFFECTS MONITORING PLAN FOR WILDLIFE

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1.0 Introduction

1.1 PROJECT OVERVIEW

A Feed In Tariff (FIT) contract was awarded to Windlectric Inc. by the Ontario Power Authority (OPA) for the construction of the Amherst Island Wind Energy Project. This project has a nameplate capacity of 75 MW and is considered a Class 4 wind project under the REA regulation. The project is proposed to be developed on private land at the following location(s):

Upper-tier Municipality:	Lennox and Addington County
Lower-tier Municipality:	Loyalist Township
Geographic Township:	Amherst Island
Lot(s) and Concession(s):	Amherst Island and the mainland shoreline

The project will consist of the following permanent infrastructure as mapped in Figure 1:

- The basic components of the proposed Project include up to 36 Siemens wind turbines. The turbine model proposed utilizes the same 36 turbine pad locations that have been subject to the assessment required under REA. The layout includes 24 Siemens SWT-2.3-113 2300 kW and 12 Siemens SWT-2.3-113 2221 kW model wind turbines. The final layout will result in a total installed nameplate capacity of approximately 56 - 75 MW. The number of wind turbines will be dependent upon final selection of the model of the wind turbine most appropriate to the proposed Project. The proposed Project will also include a 34.5 kilovolt (kV) underground and/or overhead electrical power line collector system, fibre optic data lines from each turbine and/or wireless technology for the communication of data, a transmission line, truck turnaround areas, a submarine cable, an operations and maintenance building, permanent dock, a substation, a switching station, an un-serviced storage shed, one connection point to the existing electrical system, cable vault areas, meteorological tower(s) (met tower(s)), access road(s) to the met tower site(s), and turbine access roads with culvert installations, as required, at associated watercourse crossings.

The project will consist of the following temporary infrastructure as mapped in Figure 1:

- Temporary components during construction may include staging areas for the turbines, access roads, met tower(s), collector lines and transmission line as well as crane paths, a temporary dock, site office(s), batch plant, central staging areas, and associated watercourse crossings.

1.2 PURPOSE OF THE ENVIRONMENTAL EFFECTS MONITORING PLAN

An Environmental Effects Monitoring Plan (EEMP) must be prepared to address negative environmental effects that may result from engaging in the renewable energy project. The EEMP must set out:

- Performance objectives in respect of the negative environmental effects; and
- Mitigation measures to assist in achieving the performance objectives.

A program for monitoring negative environmental effects for the duration of the time that the project is engaged in, including a contingency plan to be implemented if any mitigation measures fail.

Furthermore, all Class 3 and 4 wind facilities must prepare an EEMP in respect of birds and bats in accordance with the following publications of the Ministry of Natural Resources:

- *Bats and Bat Habitats: Guidelines for Wind Power Projects (OMNR 2011a)*
- *Birds and Bird Habitats: Guidelines for Wind Power Projects (OMNR 2011b)*

This post-construction monitoring plan is one component of the EEMP submitted to the Ministry of the Environment as part of the REA Application for the Project. This document has been prepared in accordance with O. Reg. 359/09, MNR's *Bats and Bat Habitats: Guidelines for Wind Power Projects* (July 2011) and MNR's *Birds and Bird Habitats: Guidelines for Wind Power Projects* (December 2011).

2.0 Post-Construction Monitoring for Significant Natural Features

As indicated in the Environmental Impact Study (EIS), prepared in accordance with section 38(2) of the Renewable Energy Approvals Regulation (O.Reg 359/09), the following confirmed significant and provincially significant natural features will receive post-construction monitoring:

- Raptor Wintering Area (RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7, RWA8);
- Landbird Migratory Stopover Area (ML1, ML2, ML3, ML4, ML5);
- Woodland Area-Sensitive Breeding Bird Habitat (ABB1);
- Open Country Breeding Bird and Short-eared Owl Breeding Habitat (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8, OCB9); and
- Shrub/early Successional Bird Breeding Habitat (SBB4, SBB5).

The location of each significant or provincially significant natural feature is shown in Figure 1. The potential negative environmental effects, performance objectives, mitigation strategy, environmental effects monitoring plan along with contingency measures are described in Table 1. All information in this report related to wildlife habitat is also assessed in the Natural Heritage Assessment and Environmental Impact Statement for Amherst Wind Energy Project (Stantec 2012). The environmental effects monitoring plan for each feature includes the post-construction survey methods, monitoring locations, frequency and duration of sample collection, technical and statistical value of the date, and reporting requirements.

2.1 CONTINGENCY MEASURES

Where mitigation measures are found to not be effective, the contingency measure identified in Table 1 will be implemented immediately. If contingency measures need to be implemented MOE and other relevant agencies (where required, or upon the request of the approval holder) will be notified immediately, and if required, MOE and other relevant agencies will be consulted to determine appropriate contingency measures.

2.2 REPORTING REQUIREMENTS

The Ministry of Environment (MOE) will be provided with a report that summarizes the results of the EEMP for all aspects of the project. The Ministry of Natural Resources (MNR) will be provided with a Copy of the annual report that summarizes the results of the monitoring described in this report.

Table 1: Summary of the Environmental Effects Monitoring Plan for significant/provincially significant natural features in and within 120 m of the Amherst Island Wind Energy Project where an operational impact has the potential to occur during construction, operation, and/or decommissioning.

Unique Feature ID	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Rationale	Reporting Requirements	
CONSTRUCTION AND DECOMISSIONING									
Significant Woodlands (1, 2, 3, 4, 7, 9, 10, 15, 18, 20, 21, 23, 28,32, and 36)	Loss of woodland habitat Accidental damage to root zones Accidental damage to trees or damage to limbs Dust generation, sedimentation and erosion during construction Contamination through accidental spills during construction	Remove minimal amount of woodland Prevent damage to the root zones Prevent accidental damage to trees or damage to limbs Minimize dust generation, prevent sedimentation and erosion Manage the risk of accidental spills	Mitigation during construction and decommissioning	Clearly delineate work area using a barrier such as a silt fence to avoid accidental encroachment on the feature that would lead to damage of trees and root zones. Workers will be advised not to trespass beyond the boundary of the marked area.	-check silt fencing along the periphery of significant woodlands	-daily when construction activities occur within the immediate vicinity of significant woodlands and when inclement weather is anticipated (i.e. rain events)	Prevent potential negative environmental effects	None	Any tree limbs or root zones that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques
				The boundaries of the limit of construction within Woodland 9 will be delineated and flagged / staked in the field by a qualified ecologist prior to construction to assist with the demarcation of the construction area, to ensure construction activities do not encroach beyond the limited construction area.	-check silt fencing along limits of construction through Woodland 9	-daily when construction activities occur within the immediate vicinity of Woodland 9	Prevent potential negative environmental effects	None	Any tree limbs or root zones that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques
				Erect silt fencing to prevent sedimentation within critical root zones Implement a sedimentation and erosion control plan. Any issues should be resolved in a timely fashion.	-check silt fencing along the periphery of significant woodlands to make sure it is fully functional	-daily when construction activities occur within the immediate vicinity of significant woodlands and when inclement weather is anticipated (i.e. rain events)	Prevent potential negative environmental effects	None	Any build up of sediment beyond the silt fence will be cleaned up and removed to avoid risk of further spread of sediment.
				Implement dust suppression (i.e. watering) on access roads as required.	- access roads within 30m of significant woodlands	-ongoing when construction activities occur within the immediate vicinity of woodlands	Prevent potential negative environmental effects	None	Increase frequency of dust suppression measures
				Re-vegetate disturbed areas as soon as construction activity within the disturbed areas is complete.	-check that seed grows in areas of disturbance within one growing season	-once after seeding area	Prevent potential negative environmental effects	None	Replant areas where seed does not grow to ensure vegetation establishes within the growing season
				All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from	Not required	Not required	Prevent potential negative environmental effects		Keep emergency spill kits on site Implement MOE spill action plan if necessary

Table 1: Summary of the Environmental Effects Monitoring Plan for significant/provincially significant natural features in and within 120 m of the Amherst Island Wind Energy Project where an operational impact has the potential to occur during construction, operation, and/or decommissioning.

Unique Feature ID	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Rationale	Reporting Requirements	
				significant woodlands.					Dispose of waste material by authorized and approved offsite vendors
				Implement infiltration (i.e. minimize paved surfaces and design roads to promote infiltration) techniques to the maximum extent possible to avoid changes in soil moisture and compaction.	Not required	Not required	Prevent potential negative environmental effects	None	Not required
Significant Wetlands (all except 6 and 7)	Degradation of wetland through dust, erosion and/or sedimentation Changes in surface water flow patterns which impacts vegetation growth. Contamination through accidental spills during construction. New edge creation by vegetation removal close to wetlands.	Minimize dust generation, prevent erosion and sedimentation Maintain existing surface water flow patterns Manage the risk of accidental spills Avoid encroachment into significant wetlands	Mitigation during construction and decommissioning	Absolutely no encroachment into the wetland is permitted. The boundaries of all wetlands within 30 m of the proposed construction area will be flagged / staked in the field by a qualified ecologist prior to construction to assist with the demarcation of the construction area, to ensure construction activities avoid these sensitive areas, and to assist with the proper field installation of E&S controls. Workers will be advised not to trespass beyond the boundary of the marked area.	-check silt fencing along the periphery of significant wetlands	-daily when construction activities occur within the immediate vicinity of wetlands and when inclement weather is anticipated (i.e. rain events)	Prevent potential negative environmental effects	None	Restoration of damaged or degraded wetland habitat, which may involve reseeding with a native wetland seed mix.
				Erect silt fencing to prevent sedimentation within critical root zones. Implement a sedimentation and erosion control plan. Any issues should be resolved in a timely fashion.	-check silt fencing along the periphery of each wetland to make sure it is fully functional	-daily when construction activities occur within the immediate vicinity of wetlands and when inclement weather is anticipated (i.e. rain events)	Prevent potential negative environmental effects	None	Any build-up of sediment beyond the silt fence will be cleaned up and removed to avoid risk of further spread of sediment into the wetland.
				Implement dust suppression (i.e. watering) as required.	- access roads within 30m of significant wetlands	-ongoing when construction activities occur within the immediate vicinity of wetlands	Prevent potential negative environmental effects	None	Increase frequency of dust suppression measures
				Re-vegetate disturbed areas as soon as construction activity within the disturbed areas is complete.	-check that seed grows in areas of disturbance within one growing	-once after seeding area	Prevent potential negative environmental effects	None	Replant areas where seed does not grow to ensure vegetation establishes within the growing season

Table 1: Summary of the Environmental Effects Monitoring Plan for significant/provincially significant natural features in and within 120 m of the Amherst Island Wind Energy Project where an operational impact has the potential to occur during construction, operation, and/or decommissioning.

Unique Feature ID	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Rationale	Reporting Requirements	
					season				
				All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from wetlands.	Not required	Not required	Prevent potential negative environmental effects	None	Keep emergency spill kits on site Implement MOE spill action plan if necessary Dispose of waste material by authorized and approved offsite vendors
				Where possible, and as appropriate, access roads will be constructed at or near existing grade to maintain surface flow contributions to wetlands. Limit changes in land contours to ensure natural drainage patterns are maintained.	-upon completion of grading and after rain event ensure that surface water drainage patterns consistent with drainage patterns that occurred before grading	-once post-grading activity and after rain event	Prevent potential negative environmental effects	None	Adjust grading to achieve natural drainage patterns
				Where new access roads cross existing drainage features, design will include culverts or other appropriate structures of sufficient size to accommodate flow.	-upon installation of culverts and after rain event ensure that surface water drainage patterns consistent with drainage patterns that occurred before grading	-once post-grading activity and after rain event	Prevent potential negative environmental effects	None	Adjust grading to achieve natural drainage patterns
Raptor Wintering Areas (RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7, RWA8)	Loss of habitat Disturbance due to increased traffic and noise Dust generation, sedimentation and erosion during construction.	Habitat compensation measures Prevent habitat avoidance/disturbance of caused by noise and dust generation	Mitigation during construction and decommissioning	Development of a management strategy with agencies, interested landowners and other interested parties to implement some of the recommendations provided in the Owl Woods Management Plan (Ecological Services 2011).	As will be outlined in the management strategy.	As will be outlined in the management strategy.	Prevent potential negative environmental effects	None	Not required.
				The boundaries of the limit of construction within grassland habitat will be delineated and flagged / staked in the field by a qualified ecologist prior to construction to assist with the demarcation of the construction area, to ensure construction activities do not encroach beyond the limited	-check limits of construction through significant grassland habitat is respected.	-daily when construction activities are ongoing in grassland habitat.	Prevent potential negative environmental effects	None	Immediately restore disturbed areas by reseeding.

Table 1: Summary of the Environmental Effects Monitoring Plan for significant/provincially significant natural features in and within 120 m of the Amherst Island Wind Energy Project where an operational impact has the potential to occur during construction, operation, and/or decommissioning.

Unique Feature ID	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Rationale	Reporting Requirements	
				construction area.					
				Limit tree clearing in hedgerows to maintain perch and roost sites.	Not required	Not required	Prevent potential negative environmental effects	None	Not required
				Implement dust suppression (i.e. watering) on access roads as required.	- all access roads	-ongoing during construction	Prevent potential negative environmental effects	None	Increase frequency of dust suppression measures
Turtle Overwintering Area (TO1)**	Wetland degradation due to dust, siltation or accidental spill	Minimize dust generation, prevent sedimentation and erosion Manage the risk of accidental spills	Mitigation during construction and decommissioning	Turtle overwintering area is contained within the Long Point Marsh Provincially Significant Wetland. Implementation of mitigation measures for significant wetlands outlined above, will limit disturbance to stopover habitat.	Monitoring as outlined in significant wetlands (above)	Monitoring as outlined in significant wetland (above)	Prevent potential negative environmental effects	None	Contingency Plan as outlined in significant wetlands (above)
Migratory Landbird Stopover Area (ML1, ML2, ML3, ML4, ML5)	Disturbance due to increased traffic, noise, or dust	Minimize disturbance to wildlife Minimize dust generation	Mitigation during construction and decommissioning	Each of the migratory landbird stopover areas occurs within significant woodlands. Implementation of mitigation measures for significant woodlands outlined above, will limit disturbance to stopover habitat.	Monitoring as outlined in significant woodland (above)	Monitoring as outlined in significant woodland (above)	Prevent potential negative environmental effects	None	Contingency Plan as outlined in significant woodlands (above)
Old Growth Forest (OGF1, OGF2, OGF3)	Woodland degradation due to dust or siltation.	Minimize dust generation and siltation.	Mitigation during construction and decommissioning	Each of the old growth forest habitats occur within significant woodlands. Implementation of mitigation measures for Significant Woodlands outlined above, will limit disturbance to stopover habitat.	Monitoring as outlined in significant woodland (above)	Monitoring as outlined in significant woodland (above)	Prevent potential negative environmental effects	None	Contingency Plan as outlined in significant woodlands (above)
Amphibian Breeding (Woodland and Wetland) (ABWO2, ABWO3, ABWE1, ABWE2)	Wetland degradation due to dust, siltation or accidental spill	Minimize dust generation, prevent sedimentation and erosion Manage the risk of accidental spills	Mitigation during construction and decommissioning	Amphibian breeding habitat is contained within provincially significant wetlands. Implementation of mitigation measures for significant wetlands outlined above, will limit disturbance to stopover habitat.	Monitoring as outlined in significant wetlands (above)	Monitoring as outlined in significant wetland (above)	Prevent potential negative environmental effects	None	Contingency Plan as outlined in significant wetlands (above)
OPERATION									
Raptor Wintering Area (RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7,	Disturbance to wintering raptors during operation within the Study Area	The number of species and the number of individual wintering raptors within the Study Area will be monitored and compared to pre-construction conditions.	Post-construction Disturbance Monitoring Program	Area searches by vehicle and by foot using pre-construction methods (see NHA Section 4.1.3).	Within features RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7 and RWA8	Twice monthly surveys in November through March for three years.	Compare numbers of species and individuals between years.	Annually	Should performance objectives not be met: 1. Compare declines to population trends noted

Table 1: Summary of the Environmental Effects Monitoring Plan for significant/provincially significant natural features in and within 120 m of the Amherst Island Wind Energy Project where an operational impact has the potential to occur during construction, operation, and/or decommissioning.

Unique Feature ID	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Rationale	Reporting Requirements	
RWA8)		MNR, along with the proponent and other relevant agencies, will collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect to wintering raptors is occurring, and whether such effect is attributed to the wind turbines and not external factors. These discussions will determine whether contingency measures will be undertaken.							through province or continent-wide breeding bird surveys 2. Compare annual fluctuations to local and provincial trends (Christmas Bird Counts) 3. Develop additional studies to determine extent of disturbance effect 4. Investigate habitat management means to increase breeding density Additional monitoring and/or mitigation may be required where post-construction monitoring identifies ecologically significant disturbance/avoidance effects associated with wintering raptors. Mitigation techniques may include (but are not limited to) operational controls, such as periodic shut-down and/or blade feathering as per MNR's Bird and Bird Habitat Guidelines (2011). Results will be reviewed collectively by the proponent, MNR and other relevant agencies to determine if and when additional monitoring and/or mitigation is required. The best available science and information should be considered when determining appropriate mitigation.
	Avoidance by wintering raptors in proximity to operating wind turbines	Measure the potential degree of disturbance effects to hunting raptors (particularly Short-eared Owls) in proximity to operating wind turbines.	Post-construction Disturbance Monitoring Program	Behavioral studies in proximity to operations wind turbines.	Within features RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7 and RWA8	Twice monthly surveys in November through March for three years.	Evaluate extend of potential disturbance by wind turbines.	Annually	
Landbird Migratory Stopover Area (ML1, ML2, ML3, ML4, ML5)	Disturbance to migrating landbirds during operation	The number of species and the number of individual migratory landbirds will be monitored and compared to pre-construction conditions MNR, along with the proponent and other relevant agencies, will collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect to migratory landbirds is occurring, and whether such effect is attributed to the wind turbines and not external factors. These discussions will determine whether contingency measures will be undertaken.	Post-construction Disturbance Monitoring Program	Transect survey using pre-construction methods (see NHA Section 4.1.3).	Within features ML1, ML2, ML3, ML4	Weekly surveys in May and in September through October, for three years.	Ability to directly compare numbers of species and individuals between years	Annually	Should performance objectives not be met: 1. Compare declines to population trends noted through local or province-wide migration monitoring 2. Develop additional control/impact studies to assess whether decline is due to turbine disturbance, and determine extent of disturbance effect Additional monitoring and/or mitigation may be required where post-construction monitoring identifies ecologically significant disturbance/avoidance effects

Table 1: Summary of the Environmental Effects Monitoring Plan for significant/provincially significant natural features in and within 120 m of the Amherst Island Wind Energy Project where an operational impact has the potential to occur during construction, operation, and/or decommissioning.

Unique Feature ID	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Rationale	Reporting Requirements	
		For monitoring and comparison purposes, the list of species should be refined to only include migratory landbirds.							associated with landbird migration stopover habitat. Mitigation techniques may include (but are not limited to) operational controls, such as periodic shut-down and/or blade feathering as per MNR's Bird and Bird Habitat Guidelines (2011). Results will be reviewed collectively by the proponent, MNR and other relevant agencies to determine if and when additional monitoring and/or mitigation is required. The best available science and information should be considered when determining appropriate mitigation.
Woodland Area-Sensitive Breeding Bird Habitat (ABB1)	Disturbance to woodland area sensitive breeding birds during operation	The breeding woodland area-sensitive species (combined and individual), within the habitat, will be monitored and compared to pre-construction conditions. MNR, along with the proponent and other relevant agencies, will collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect to woodland area-sensitive breeding birds is occurring, and whether such effect is attributed to the wind turbines and not external factors. These discussions will determine whether contingency measures will be undertaken.	Post-construction Disturbance Monitoring Program	Area searches using pre-construction methods (see NHA Section 4.1.3).	Within feature ABB1	Three rounds of surveys annually for 3 years.	Breeding diversity can be compared among years or between control/impact sites	Annually	Should performance objectives not be met: 1. Compare declines to population trends noted through province or continent-wide breeding bird surveys 2. Develop additional studies to determine extent of disturbance effect 3. Investigate habitat management means to increase breeding density Additional monitoring and/or mitigation may be required where post-construction monitoring identifies ecologically significant disturbance/avoidance effects associated with woodland area-sensitive breeding bird habitat. Mitigation techniques may include (but are not limited to) operational controls, such as periodic shut-down and/or blade feathering as per MNR's Bird and Bird Habitat Guidelines (2011). Results will be reviewed collectively by the proponent, MNR and other relevant agencies to determine if and when additional monitoring and/or mitigation is required. The best available science and information should be considered when determining appropriate mitigation.

Table 1: Summary of the Environmental Effects Monitoring Plan for significant/provincially significant natural features in and within 120 m of the Amherst Island Wind Energy Project where an operational impact has the potential to occur during construction, operation, and/or decommissioning.

Unique Feature ID	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Rationale	Reporting Requirements	
Open Country Breeding Bird and Short-eared Owl Breeding Habitat (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8, OCB9)	Disturbance to open country breeding birds, including Short-eared Owls, during operation.	The breeding density of open country breeding birds and sensitive species (combined and individual), within the habitat, will be monitored and compared to pre-construction conditions. MNR, along with the proponent and other relevant agencies, will collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect to open country breeding birds, including Short-eared Owls, is occurring, and whether such effect is attributed to the wind turbines and not external factors. These discussions will determine whether contingency measures will be undertaken.	Post-construction Disturbance Monitoring Program	Point count survey and area searches using pre-construction methods (see NHA Section 4.1.3).	Within features OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8 and OCB9	Three rounds of surveys annually for 3 years.	Breeding pair density is a standard measure that can be compared among years or between control/impact sites	Annually	Should performance objectives not be met: 1. Compare declines to population trends noted through province or continent-wide breeding bird surveys 2. Develop additional studies to determine extent of disturbance effect 3. Investigate habitat management means to increase breeding density Additional monitoring and/or mitigation may be required where post-construction monitoring identifies ecologically significant disturbance/avoidance effects associated with open country breeding bird and Short-eared Owl habitat. Mitigation techniques may include (but are not limited to) operational controls, such as periodic shut-down and/or blade feathering as per MNR's Bird and Bird Habitat Guidelines (2011). Results will be reviewed collectively by the proponent, MNR and other relevant agencies to determine if and when additional monitoring and/or mitigation is required. The best available science and information should be considered when determining appropriate mitigation.
	Avoidance from open country breeding birds, including Short-eared Owls in proximity to operational wind turbines.	The breeding density of open country breeding birds and sensitive species will be monitored and compared at different distance regimes from operating wind turbines. MNR, along with the proponent and other relevant agencies, will collectively review the results of the post-construction monitoring to determine if an ecologically significant disturbance/avoidance effect to open country breeding birds, including Short-eared Owls, is occurring, and whether such effect is attributed to the wind turbines and not external factors. These discussions will determine whether contingency measures will be undertaken.	Post-construction Disturbance Monitoring Program	Paired point counts extending from the base of wind turbine generators located in grassland habitat with an equal number of paired point counts located more than 120 m from wind turbine generators in grassland	Within features OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8 and OCB9	Three rounds of surveys annually for 3 years.	Breeding pair density is a standard measure that can be compared between distance regimes.	Annually	
Shrub/early Successional Bird Breeding Habitat (SBB4, SBB5)	Disturbance to shrub/early successional bird breeding habitat, during operation.	The breeding density of shrub/early successional breeding birds, within the habitat, will be monitored and compared to pre-construction conditions. MNR, along with the proponent and other relevant agencies, will collectively review the results of the post-construction monitoring to determine if an ecologically significant	Post-construction Disturbance Monitoring Program	Area searches using pre-construction methods (see NHA Section 4.1.3).	Within features SBB4 and SBB5.	Three rounds of surveys annually for 3 years.	Breeding diversity can be compared among years or between control/impact sites	Annually	Should performance objectives not be met: 1. Compare declines to population trends noted through province or continent-wide breeding bird surveys 2. Develop additional studies to determine extent of disturbance effect 3. Investigate habitat

Table 1: Summary of the Environmental Effects Monitoring Plan for significant/provincially significant natural features in and within 120 m of the Amherst Island Wind Energy Project where an operational impact has the potential to occur during construction, operation, and/or decommissioning.

Unique Feature ID	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Environmental Effects Monitoring Plan					Contingency Measure
				Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Rationale	Reporting Requirements	
		disturbance/avoidance effect to shrub/early successional, is occurring, and whether such effect is attributed to the wind turbines and not external factors. These discussions will determine whether contingency measures will be undertaken.							management means to increase breeding density Additional monitoring and/or mitigation may be required where post-construction monitoring identifies ecologically significant disturbance/avoidance effects associated with shrub/early successional breeding bird habitat. Mitigation techniques may include (but are not limited to) operational controls, such as periodic shut-down and/or blade feathering as per MNR's Bird and Bird Habitat Guidelines (2011). Results will be reviewed collectively by the proponent, MNR and other relevant agencies to determine if and when additional monitoring and/or mitigation is required. The best available science and information should be considered when determining appropriate mitigation.

3.0 Post-Construction Monitoring for Bat and Bird Mortality

Post-construction mortality surveys are required for all Class 3 and 4 wind power projects. This Post-Construction Monitoring Plan is one component of the EEMP of the REA Application for the Project, and has been prepared in accordance with MNR's *Bats and Bat Habitats: Guidelines for Wind Power Projects* (July 2011) and MNR's *Birds and Bird Habitats: Guidelines for Wind Power Projects* (December 2011).

3.1 MORTALITY THRESHOLDS

A threshold approach will be used to identify and mitigate significant bat and bird mortality resulting from the operation of wind turbines.

3.1.1 Bats

Bat mortality is considered to be significant when a threshold of annual bat mortality (averaged across the site) exceeds:

- 10 bats / turbine / year

This threshold has been determined based on bat mortality reported at wind power projects in Ontario and comparison with jurisdictions across North America.

3.1.2 Birds

Bird mortality is considered to be significant when a threshold of annual bird mortality exceeds:

- 14 birds / year at individual turbines or turbine groups
- 0.2 raptors / turbine / year (all raptors) across a wind power project; or
- 0.1 raptors / turbine / year (provincially tracked raptors) across a wind power project

Provincially tracked raptors are defined as raptors of provincial conservation concern by MNR's Natural Heritage Information Centre (NHIC).

3.2 POST-CONSTRUCTION MONITORING METHODS

Post construction bat and bird mortality surveys estimate bird and bat mortality from wind turbines and may identify species and specific periods of high mortality. This knowledge can be used to evaluate the success of mitigation measures, establish protocols for operational mitigation, and inform adaptive management.

Bat and bird mortality surveys identify the number of bats or birds killed per turbine over a known period of time (expressed as bats/turbine/year or birds/turbine/year). This value represents an estimate of bat and bird mortality adjusted for carcass removal rates, searcher efficiency, and percent area searched. Standard methods for mortality surveys are identified below. Typically, a monitoring year is typically considered to be from May 1 – October 31, and

continues until November 30 specifically for raptor monitoring. However, at the Amherst Island Wind Energy Project, monitoring is proposed for the full year (12 months) due to the presence of significant wildlife habitat for wintering raptors.

Post-construction monitoring is required for 3 years at all Class 3 and 4 wind power projects. Post-construction monitoring will consist of:

- Regular bat/bird mortality surveys around specific wind turbines
- Monitoring of bat/bird carcass removal rate by scavengers (or other means)
- Monitoring of bird/bat searcher efficiency (i.e. number of bat/bird fatalities present that are actually detected by surveyors)
- Avoidance-disturbance effects monitoring (where a project is located within 120 m of bat/bird Significant Wildlife Habitat (SWH))
- For birds, subsequent 2 years of scoped mortality and cause and effects monitoring at individual turbines (and unmonitored turbines in near proximity), following any given year where an annual post-construction morality report identifies significant bird or raptor mortality; and
- For bird/bats, an additional 3 years of effectiveness monitoring where mitigation is applied

All searchers will have updated rabies pre-exposure vaccinations.

3.2.1 Effort and Timing for Bird and Bat Mortality Monitoring

Requirements for post-construction mortality monitoring at the Amherst Island Wind Energy Project include:

- Post-construction monitoring (including mortality surveys, carcass removal and searcher efficiency trials) will be conducted during the core season when bats are active, and in coordination of bird mortality monitoring (May 1 – October 31) for the first 3 years of wind turbine operation.
- Mortality surveys will be conducted at each monitored turbine twice per week (3 and 4 day intervals) from May 1 – October 31; surveys for raptor mortality will be continued once per week from November 1 – April 30.
- Bat and bird mortality surveys will occur at a sub-sample of at least 30% of turbines (minimum 10 turbines) will be selected to cover representative areas throughout the project location.
- For birds, all turbines within the project location will be monitored once a month during the May 1-October 31 survey period for evidence of raptor mortalities.
- Should significant annual bird mortality is identified, subsequent scoped mortality and cause effects monitoring will be conducted for 2 years at individual turbines (and unmonitored turbines in near proximity).
- Should significant bat or bird mortality be observed, and operational mitigation implemented, post-construction monitoring will be conducted for an additional 3 years from the implementation of operational mitigation to evaluate the effectiveness of the mitigation.

A total of 10 turbines (30% of the 33 turbines that will be constructed) will be selected to cover representative areas throughout the project location. The start date of the post-construction monitoring will be dependent on the commercial operation date of the facility. If full project commissioning is delayed, post-construction monitoring of a partially completed project will not be delayed for longer than 1 year.

3.2.2 Carcass Searches

Carcass removal by scavengers can be variable among sites (varying by vegetation cover, terrain and season) and must be considered when estimating total bat and bird mortality. Carcass searches will consider the following:

- The sub-sample of wind turbines that are monitored will include all habitat types and avian significant wildlife habitat present at the site, and will cover the spatial distribution of the wind turbines. Wind turbines will be selected through a scientifically defensible system (e.g. stratification).
- The time required to search each turbine will vary depending on the surrounding habitat (e.g. open field vs. forest, etc.) and individual searchers, but searchers will aim for a consistent search time for all surveyed turbines (e.g. 20 minutes per turbine).
- Each surveyed turbine will have a search area that has a 50 m radius.
- Within this 50 m radius, the search area will be examined using transects 5.0-6.0 m apart allowing for a visual search of 2.5-3.0 m on each side. The search area may be rectangular, square or circular depending on turbine locations and arrangements and surrounding terrain.
- The search area of each turbine will be mapped into visibility classes according to the following table. Where the majority of the search area would not be searchable due to vegetation cover or other impediments (e.g. Visibility Class 4) these turbines will not be included in the sub-sample of monitored turbines.

%Vegetation Cover	Vegetation Height	Visibility Class
≥90% bare ground	≤15cm tall	Class 1 (Easy)
≥25% bare ground	≤15cm tall	Class 2 (Moderate)
≤25% bare ground	≤25% > 30cm tall	Class 3 (Difficult)
Little or no bare ground	≥25% > 30cm tall	Class 4 (Very Difficult)

- All carcasses found will be photographed and recorded/labeled with species, sex (if possible), date, time, location (UTM coordinate), carcass condition, searcher, injuries, ground cover, and distance and direction to nearest turbine.
- Weather conditions including wind speed and precipitation will be included as part of the data collection.

- The estimated number of days since death, and condition of each carcass collected will be recorded in one of the following categories:
    - Fresh
    - Early decomposition
    - Moderate decomposition
    - Advanced decomposition
    - Complete decomposition
    - Scavenged

- Bird carcasses found during mortality monitoring will be collected and stored in a freezer and used in carcass removal or searcher efficiency trials, assuming they are in reasonable condition.
- Carcasses of the following species found during bat mortality searches will be stored in a freezer and used in carcass removal or searcher efficiency trials, assuming they are in reasonable condition:
    - *Lasionycteris noctivagans* (Silver-haired Bat)
    - *Lasiurus cinereus* (Hoary Bat)
    - *Lasiurus borealis* (Eastern Red Bat)

- Because of white-nose syndrome contamination risks, the following species will not be used in carcass removal or searcher efficiency trials (carcasses of these species may be sent to the Canadian Cooperative Wildlife Health Centre for analysis of white-nose syndrome):
    - *Myotis septentrionalis* (Northern Long-eared Bat)
    - *Myotis lucifugus* (Little Brown Bat)
    - *Myotis leibii* (Eastern Small-footed Bat)
    - *Perimyotis subflavus* (Tricolored Bat)
    - *Eptesicus fuscus* (Big Brown Bat)

3.2.3 Carcass Removal Trials

The level of carcass scavenging must be determined through carcass removal trials. In these trials carcasses are placed around the wind turbines and monitored until they disappear. The average carcass removal time is a factor in determining the estimated bat or bird mortality. As carcass removal rates vary considerably from one site to another and seasonally, removal trials will be conducted at every wind power project for every year of monitoring.

Below are some important considerations for conducting carcass removal rate trials:

- Carcass removal trials will be conducted at least once a season (spring, summer, fall and winter) during the same period as the mortality surveys. Trials will be conducted

once per month if vegetation changes occur during the season (e.g. crops grow, harvest, etc.).

- A minimum of 10 carcasses will be used for each trial with no more than 5 trial carcasses placed at any one time.
- Carcasses will be monitored every 3-4 days (or weekly in winter) in conjunction with carcass searches.
- Carcass removal trials will be conducted in a variety of weather conditions. Weather conditions will be recorded.
- Carcasses will be distributed across the range of different substrates/habitats and visibility classes of turbines being searched
- To the extent possible, carcass removal trials will be conducted at turbines that are not part of the carcass search sub-sample
- Carcasses will be placed before dusk using gloves and boots to avoid imparting human smell that might bias trial results (e.g. attract scavengers, etc)
- Trials will continue until all carcasses are removed or have completely decomposed (generally 2 weeks)
- To avoid confusion with turbine related fatalities, trial carcasses will be discretely marked (e.g. clipping of ear, wing, fur; hole punching ear; etc.) with a unique identification so they can be identified as trial carcasses
- Carcasses used will be as fresh as possible since frozen or decomposed carcasses are less attractive to scavengers. If frozen carcasses are used, they will be thawed prior to beginning carcass removal trials.
- To the extent possible, bat carcasses will be used for at least one third of the carcass removal trials, and bird carcasses will comprise another third of the trial carcasses. Trials using other small brown mammal or bird carcasses (e.g. mice, brown chicks) may also be used when bird and bat carcasses are not available.
- To the extent possible, raptor carcasses will be used to determine scavenging rates of raptors.
- Scavenging rates may change over time as scavengers become aware of and develop search images for new sources of food beneath turbines
- Scavenging will be determined on a site-specific basis and rates will not be assumed to be similar between sites or used in calculations for other projects.

3.2.4 Searcher Efficiency Trials

Searcher efficiency is another important factor in creating an estimate of total bat and bird mortality. Searcher efficiency trials require a known number of discretely marked carcasses to be placed around a wind turbine. Searchers examine the wind turbine area, and the number of carcasses that they find is compared to the number of carcasses placed. Searcher efficiency can vary considerably for each searcher and from one site to another (varying by vegetation cover, terrain and season), and will be conducted as part of post-construction monitoring at every wind power project for every year of monitoring.

Below are some important considerations for conducting searcher efficiency trials:

- Searcher efficiency trials will be conducted at least once a season (spring, summer and fall) during the same period as the bat mortality surveys. Trials will be conducted once per month if vegetation changes occur during the season (e.g. crops grow, harvest, etc.)
- A 'tester' will control the trials and return to collect marked trial carcasses at the completion of the trials to determine the number of carcasses remaining and if any carcasses were scavenged or removed during the trial.
- Searcher efficiency trials are to be conducted for each individual searcher or team involved in searching for carcasses. The searcher will not be notified when they are participating in an efficiency trail to avoid potential search biases.
- A minimum of 10 carcasses per searcher per season in all applicable visibility classes (see table above) are to be used. The average per searcher across all visibility classes will be used for calculations.
- Trial carcasses will be spread out over the trial period (month or season) and conducted with the mortality surveys. A maximum of 3 trial carcasses will be placed at any one time to avoid bias and flooding the area with carcasses.
- Trial carcasses are placed for one search period only and then removed and recorded by the 'tester'.
- Trial carcasses will be randomly placed within the search area and location recorded so that they can be retrieved if they are not found during the trial.
- Trial carcasses will be discreetly marked (e.g. clipping of ear, wing, leg, fur; hole-punching ear; etc.) with a unique identification so that they can be identified as a trial carcass by the tester.
- To the extent possible, bat carcasses will be used for at least one third of the carcass removal trials, and bird carcasses will comprise another third of the trial carcasses. Trials using other small brown mammal or bird carcasses (e.g. mice, brown chicks) may also be used when bird and bat carcasses are not available.
- If frozen carcasses are used, they will be thawed prior to beginning searcher efficiency trials.
- All observers will overlook some carcasses. This percentage will vary depending on the observer, the habitat and the area being searched, etc.

3.2.5 Proportion Area Searched

Based on OMNR guidelines and on industry standards, the search area will be a minimum 50 m (with consideration for searching in a 10m wide search area (i.e. 50-60m from turbine base with corresponding analysis of the results) given a 55m blade length) from a wind turbine base. Since it may not always be possible to search the entire 50 m radius because of the presence of thick or tall vegetation, steep slopes, active cultivation, etc. the actual area searched during the mortality surveys will be calculated at each turbine, using a GPS. A map of the actual search

area for each turbine searched, and a description of areas deemed to be unsearchable (e.g. vegetation height, type, slope, etc.), will be provided in the mortality report.

3.2.6 Calculations

Scavenger Correction Factor
The following formula will be used to calculate the overall scavenger correction (S_c) factors based on the proportion of carcasses remaining after each search interval are pooled:

$$S_c = \frac{n_{visit1} + n_{visit2} + n_{visit3}}{n_{visit0} + n_{visit1} + n_{visit2}}$$

Where,

S_c	is the proportion of carcasses not removed by scavengers over the search period
n_{visit0}	is the total number of carcasses placed
n_{visit1} - n_{visit3}…	are the numbers of carcasses on visits 1 through 3

Searcher Efficiency
Searcher efficiency (S_e) will be calculated for each searcher as follows:

$$S_e = \frac{\text{number of test carcasses found}}{\text{Number of test carcasses placed – number of carcasses scavenged}}$$

The number of turbines that each individual searches will vary so it will be necessary to calculate a weighted average that reflects the proportion of turbines each searcher searched. The weighted average or overall searcher efficiency will be calculated as follows:

$$S_{eo} = S_{e1}(n_1/T) + S_{e2}(n_2/T) + S_{e3}(n_3/T)\ldots$$

Where,

S_{eo}	is the overall searcher efficiency
S_{e1} and $_2$ and $_3$…	are individual searcher efficiency ratings
N_1 and $_2$ and $_3$…	are number of turbines searched by each searcher
T	is the total number of turbines searched by all searchers

Proportion Area Searched
Proportion area searched (P_s) is calculated as follows:

$$P_s = \frac{\text{actual area searched}}{\pi r^2}$$

Where r = 50 m

Corrected Mortality Estimates
The estimated bat and bird mortality (C) is calculated as follows:

$$C = c / (S_{e0} \times S_c \times P_s)$$

Where,
C is the corrected number of fatalities
c is the number of carcasses found
S_{e0} is the weighted proportion of carcasses expected to be found by searchers (overall searcher efficiency)
S_c is the proportion of carcasses not removed by scavengers over the search period
P_s is the proportion of the area searched

3.2.7 Other Considerations

- The above calculations will be presented in corrected number of bats/turbine/year and birds/turbine/year. For this project, the year will include a full 12 months.
- A separate calculation for raptor mortality will use the searcher efficiency and carcass removal results relevant to raptors.
- Carcasses may be discovered incidental to formal searches. These carcasses will be processed (i.e. collected and recorded, etc.) and fatality data will be included with the calculation of fatality rates. If the incidentally discovered carcass is found outside a formal search plot, the data will be reported separately.
- Tissue samples from bat and bird carcasses may be used in a number of DNA analyses to provide insight into population size and structure, as well as the geographic origin of migrants. The local MNR office may be contacted prior to disposing bat and bird carcasses, to determine if this type of research is occurring in the area.

3.3 POST-CONSTRUCTION MITIGATION

3.3.1 Bats

Post-construction mitigation will be required where post-construction monitoring identifies disturbance effects associated with bat SWH. Operational mitigation is required if post-construction monitoring shows that a wind power project is causing significant bat mortality. Bat mortality is considered significant when mortality levels at a project location exceed 10 bats / turbine / year.

Operational mitigation refers to adjustments made to the operation of wind turbines to help mitigate potential negative environmental effects on bats (i.e. significant bat mortality). Operational mitigation for bat mortality consists of changing the wind turbine cut-in speed to 5.5 m/s (measured at hub height), or feathering of wind turbine blades when wind speeds are below 5.5 m/s.

The majority of bat mortalities from wind turbine operations occur during fall migration. Across North America, it is estimated that 90% of bat fatalities occur from mid-July through September. Where a post-construction monitoring annual report indicates the annual bat mortality threshold of 10 bats/turbine/year has been exceeded, operational monitoring will be implemented across the wind power project (i.e. at all turbines) from sunset to sunrise, from July 15 to September 30. This mitigation will continue for the duration of the project. Should site-specific monitoring indicate a shifted peak mortality period, operational mitigation may be shifted to match the peak mortality, with mitigation maintained for a minimum 10 weeks. Any shift in the operational mitigation period to match peak mortality should be determined in coordination with and confirmed by MOE and other relevant agencies.

Where post-construction monitoring is applied, an additional 3 years of effectiveness monitoring is required. Monitoring the effectiveness of any post-construction mitigation techniques will help to evaluate the success of this mitigation.

3.3.2 Birds

Post-construction mitigation or additional scoped monitoring will be required at individual turbines or groups of turbines where post-construction monitoring identifies significant annual bird mortality, disturbance effects associated with bird SWH, or significant bird mortality events.

For turbines located outside 120 m of bird SWH, 2 years of subsequent scoped mortality and cause and effects monitoring is required where a significant annual mortality threshold has been exceeded. Following scoped monitoring, post-construction monitoring (e.g. operational mitigation) and effectiveness monitoring may be required at individual turbines where a mortality effect has been identified or significant annual mortality persists.

For turbines located within 120 m of bird SWH, immediate post-construction mitigation (including operational mitigation), as identified in the Environmental Impact Study, and 3 years of effectiveness monitoring will be required where monitoring identifies significant annual bird mortality or disturbance effects associated with bird SWH.

Operational mitigation techniques may include periodic shut-down of select turbines and/or blade feathering at specific times of the year when mortality risks to the affected bird species is particularly high (e.g. migration). Emerging and new technologies will be considered that may reduce bird fatalities.

3.4 CONTINGENCY PLANS

A contingency plan addresses immediate actions necessary in case of a significant bat or bird mortality event, or if mitigation actions fail. A contingency plan allows additional mitigation measures to be implemented in the event that unanticipated negative environmental effects are observed during a single mortality monitoring survey.

3.4.1 Bats

Should cut-in speed mitigation be implemented and the bat mortality threshold continue to be exceeded, additional mitigation and scoped monitoring requirements will be determined in consultation with MOE and other relevant agencies.

3.4.2 Birds

A significant bird mortality event is defined to have occurred when bird mortality during a single mortality monitoring survey (as observed in the field on a single day) exceeds:

- 10 or more birds at any one turbine; or
- 33 or more birds (including raptors) at multiple turbines

NOTE: These numbers are actual carcasses found (not corrected numbers)

MOE and other relevant agencies (where required, or upon the request of the approval holder) will be notified within 48 hours if one of the thresholds above is exceeded during a single mortality monitoring survey. MOE and other relevant agencies will be consulted to determine appropriate contingency plans should a significant bird mortality event occur or if mitigation actions fail.

4.0 Reporting Requirements

Data collected during post-construction monitoring will be submitted in accordance with MNR data standards and templates. Post-construction reports will be prepared and submitted as per within 3 months of the end of each monitoring year. This post-construction monitoring plan will be reviewed and updated when changes to guidelines occur, including changes methods and/or thresholds.

All bat and bird monitoring data and associated reports will be submitted to the MOE and MNR, consistent with MNR's procedures and protocols, and satisfy the data standards and requirements of the Wind Energy Bird and Bat Monitoring Database. Bat survey data submitted will be entered into the database, analyzed, reported and used to address knowledge gaps and create public data summaries. Standardized templates available online through the Wind Energy Bird and Bat Monitoring Database found at http://www.bsc-eoc.org/birdmon/wind/wind_templates.jsp will be used to record and report all field data.

Reports will also include maps of areas searched for each surveyed turbine and raw data for all carcass searches, searcher efficiency trials and carcass removal trials will be required as part of the annual report. A data sheet sample will also be provided with the mortality report.

A summary of when information about a particular mortality event or threshold is reported to Ministry of Natural Resources is included in Table 2.

Table 2: Timeline for reporting mortality to Ministry of Natural Resources

Mortality Threshold	How mortality is calculated	Reporting Timeline for Results
10 bats / turbine / year	Based on calculation described in section 3.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MOE as outlined in Table 2.
14 birds / turbine / year	Based on annual calculation described in section 3.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MOE as outlined in Table 2.
10 birds / turbine	Single event as observed in the field during monitoring	Mortality event to be reported to MOE within 48 hours of detection
33 birds (including raptors) at any multiple turbines	Single event as observed in the field during monitoring	Mortality event to be reported to MOE within 48 hours of detection
0.2 raptors / turbine / year (all raptors) across a wind power project	Based on annual calculation described in section 3.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MOE within 3 months of completing mortality monitoring for birds and bats.
0.1 raptors / turbine / year (provincially tracked raptors) across a wind power project	Based on annual calculation described in section 3.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MOE within 3 months of completing mortality monitoring for birds and bats.
Endangered and Threatened Species	Single event as observed in the field during monitoring	Mortality event to be reported to MOE within 48 hours of detection.

5.0 Closure

This Environmental Effects Monitoring Plan for the Amherst Island Wind Energy Project has been prepared in accordance with O. Reg. 359/09, s. 23.1, the MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects* (September 2009), the *MOE's Technical Guide to Renewable Energy Approvals*, MNR's *Bats and Bat Habitats: Guidelines for Wind Power Projects* (July 2011) and MNR's *Birds and Bird Habitats: Guidelines for Wind Power Projects* (December 2011).

Stantec Consulting Ltd. prepared this Environmental Effects Monitoring Plan for Windlectric Inc. Inc. for the Amherst Island Wind Power Project. Windlectric Inc. is committed to implementing the appropriate protection and mitigation measures as they apply to the construction and operation of the proposed Project.

STANTEC CONSULTING LTD

Katherine St. James

Katherine St. James
Ecologist

Andrew Taylor

Andrew Taylor
Senior Project Manager

6.0 References

OMNR. 2011a. *Bats and Bat Habitats: Guidelines for Wind Power Projects*. First Edition. Queen's Printer for Ontario, Canada.

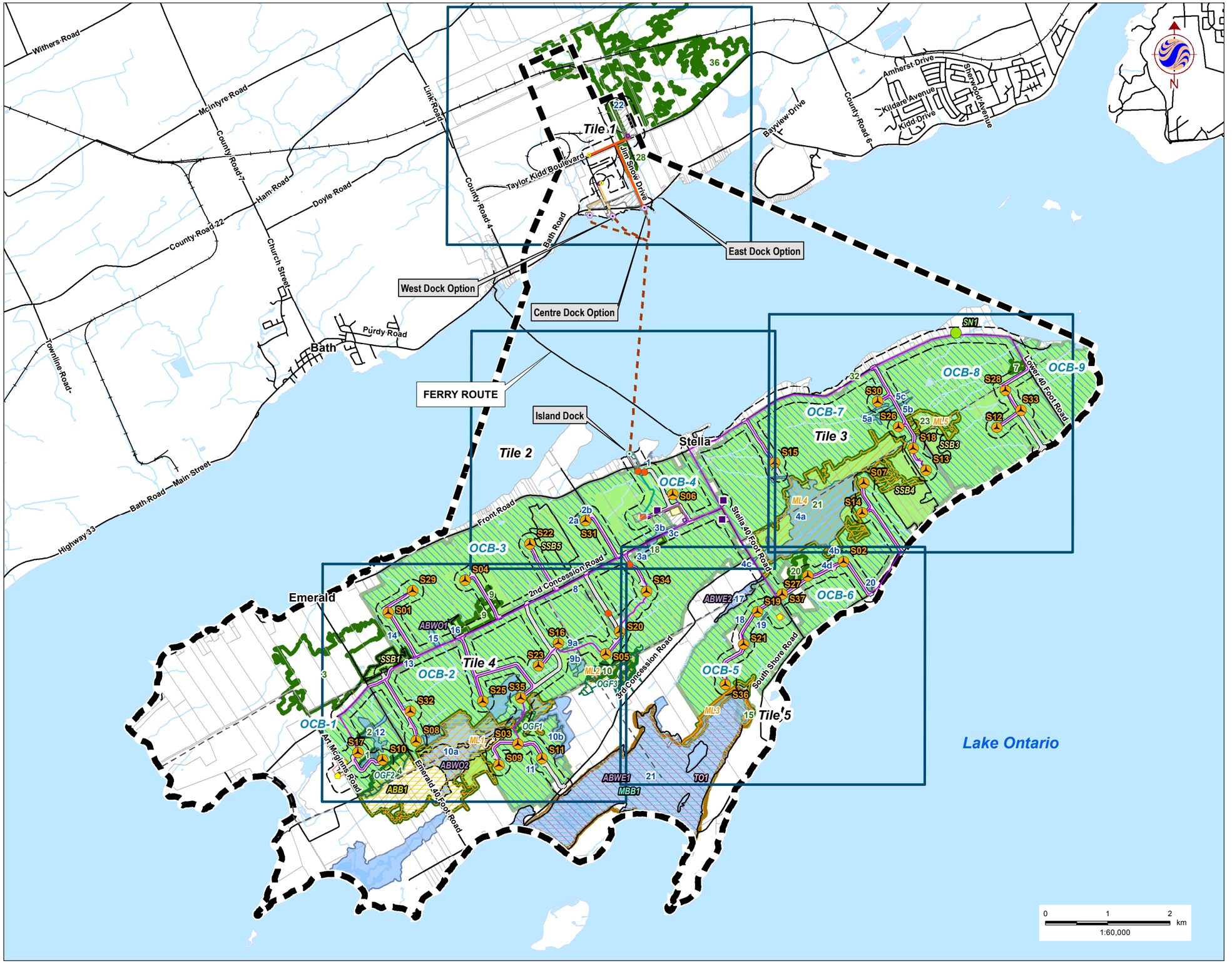
OMNR. 2011b. Birds *and Bird Habitats: Guidelines for Wind Power Projects*. First Edition. Queen's Printer for Ontario, Canada.

OMNR. September 2009. *Approval and Permitting Requirements Document for Renewable Energy Projects*. First Edition. Queen's Printer for Ontario, Canada.

Stantec Consulting Inc. 2012. Amherst Island Wind Energy Project: Natural Heritage Assessment and Environmental Impact Study.

Appendix A

Figures



Legend

- Project Study Area
- 120m Zone of Investigation

Project Components

- Turbine
- Met Tower (Potential Location)
- Substation (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)
- Storage Shed

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Waterbody
- Amherst Bay Life Science ANSI
- Property Boundary

Significant Wildlife Habitat Features

- Snake Hibernacula (SN)
- Amphibian Breeding (ABWO & ABWE)
- Area-Sensitive Breeding Bird (ABB)
- Marsh Breeding Bird (MBB)
- Shrub/Early Successional Bird Breeding (SSB)
- Turtle Overwintering (TO)
- Landbird Migratory Stopover Area (ML)
- Waterfowl Stopover & Staging - Terrestrial (WT)
- Old Growth Forest (OGF)
- Significant Woodland
- Significant Wetland
- Open Country Breeding Bird Area (OCB)
- Raptor Wintering Area (RWA)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

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Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

1.0

Title

Significant Natural Features & Wildlife Habitat - Overview

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Revised: 2013-04-03 By: pworsell

Legend

- Study Area
- 120m Zone of Investigation

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
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- Mainland Dock (Potential Location)
- Island Dock
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- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
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- Property Line

Significant Wildlife Habitat Features

- Snake Hibernacula (SN)
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- Turtle Overwintering (TO)
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- Landbird Migratory Stopover Area (ML)
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- Significant Woodland
- Significant Wetland
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- Raptor Wintering Area (RWA)

Notes

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3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

* Distances shown between project components and habitats are provided in detail in Table 3.9 in the main report.

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WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

1.1

Title

Significant Natural Features & Wildlife Habitat

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Revised: 2013-04-03 By: pworsell

Legend

- Study Area
- 120m Zone of Investigation

Project Components

- Turbine
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- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

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- Switching Station (Potential Location)

Existing Features

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- Property Line

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- Shrub/Early Successional Bird Breeding (SSB)
- Turtle Overwintering (TO)
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Figure No.

1.2

Title

Significant Natural Features & Wildlife Habitat

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Revised: 2013-04-03 By: pworsell

Legend

- Study Area
- 120m Zone of Investigation

Project Components

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WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

1.3

Title

Significant Natural Features & Wildlife Habitat

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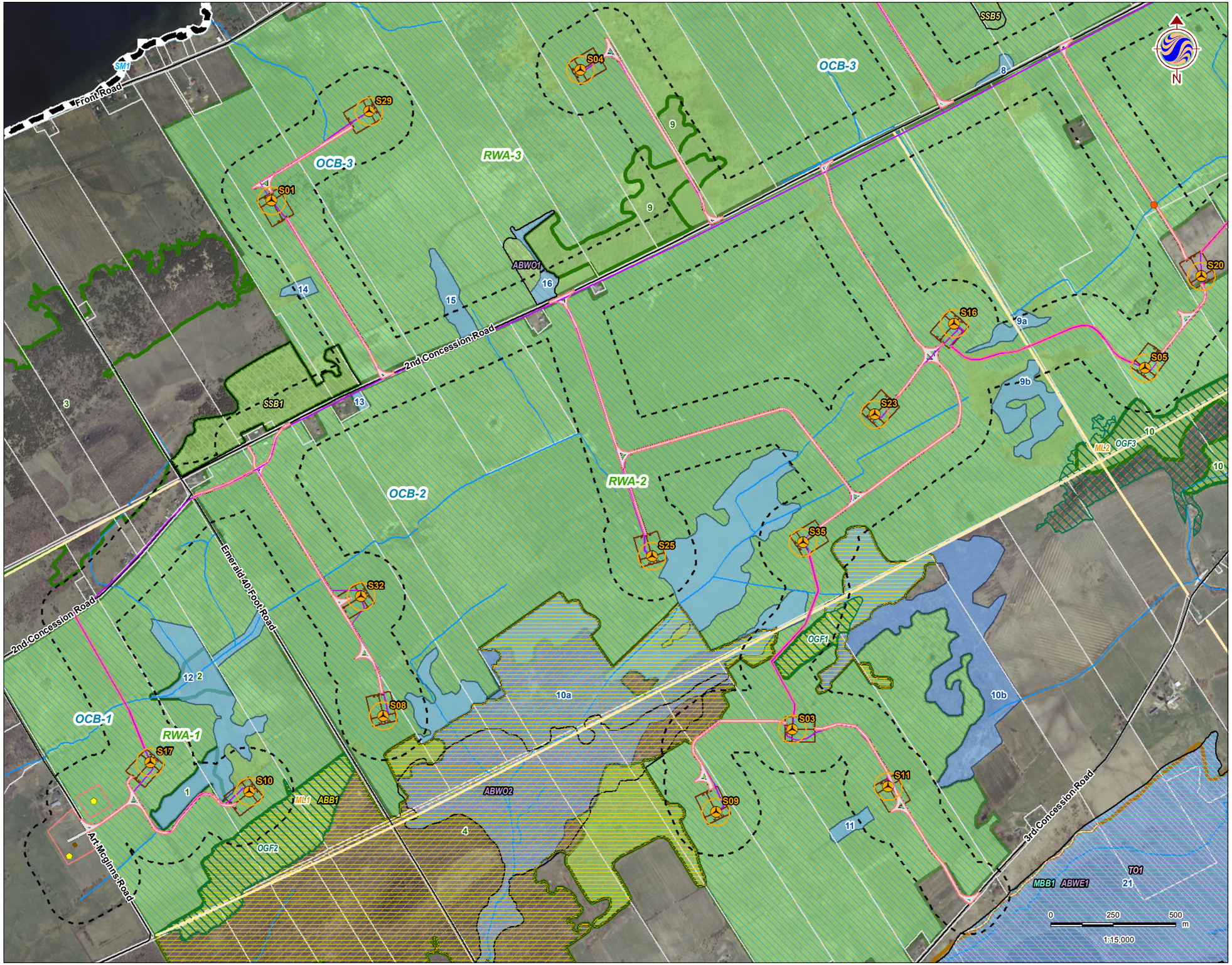
Revised: 2013-04-03 By: pworsell



Legend

- Study Area
- 120m Zone of Investigation

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Amherst Bay Life Science ANSI
- Property Line

Significant Wildlife Habitat Features

- Snake Hibernacula (SN)
- Amphibian Breeding (ABWO & ABWE)
- Area-Sensitive Breeding Bird (ABB)
- Marsh Breeding Bird (MBB)
- Shrub/Early Successional Bird Breeding (SSB)
- Turtle Overwintering (TO)
- Shorebird Migratory Stopover (SM)
- Landbird Migratory Stopover Area (ML)
- Waterfowl Stopover & Staging - Terrestrial (WT)
- Old Growth Forest (OGF)
- Significant Woodland
- Significant Wetland
- Open Country Breeding Bird Area (OCB)
- Raptor Wintering Area (RWA)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

* Distances shown between project components and habitats are provided in detail in Table 3.9 in the main report.

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April 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

1.4

Title

Significant Natural Features & Wildlife Habitat

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Revised: 2013-04-03 By: pworsell

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Revised: 2013-04-03 By: pworsell

Legend

- Study Area
- 120m Zone of Investigation

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Amherst Bay Life Science ANSI
- Property Line

Significant Wildlife Habitat Features

- Snake Hibernacula (SN)
- Amphibian Breeding (ABWO & ABWE)
- Area-Sensitive Breeding Bird (ABB)
- Marsh Breeding Bird (MBB)
- Shrub/Early Successional Bird Breeding (SSB)
- Turtle Overwintering (TO)
- Shorebird Migratory Stopover (SM)
- Landbird Migratory Stopover Area (ML)
- Waterfowl Stopover & Staging - Terrestrial (WT)
- Old Growth Forest (OGF)
- Significant Woodland
- Significant Wetland
- Open Country Breeding Bird Area (OCB)
- Raptor Wintering Area (RWA)

Notes

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3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

* Distances shown between project components and habitats are provided in detail in Table 3.9 in the main report.

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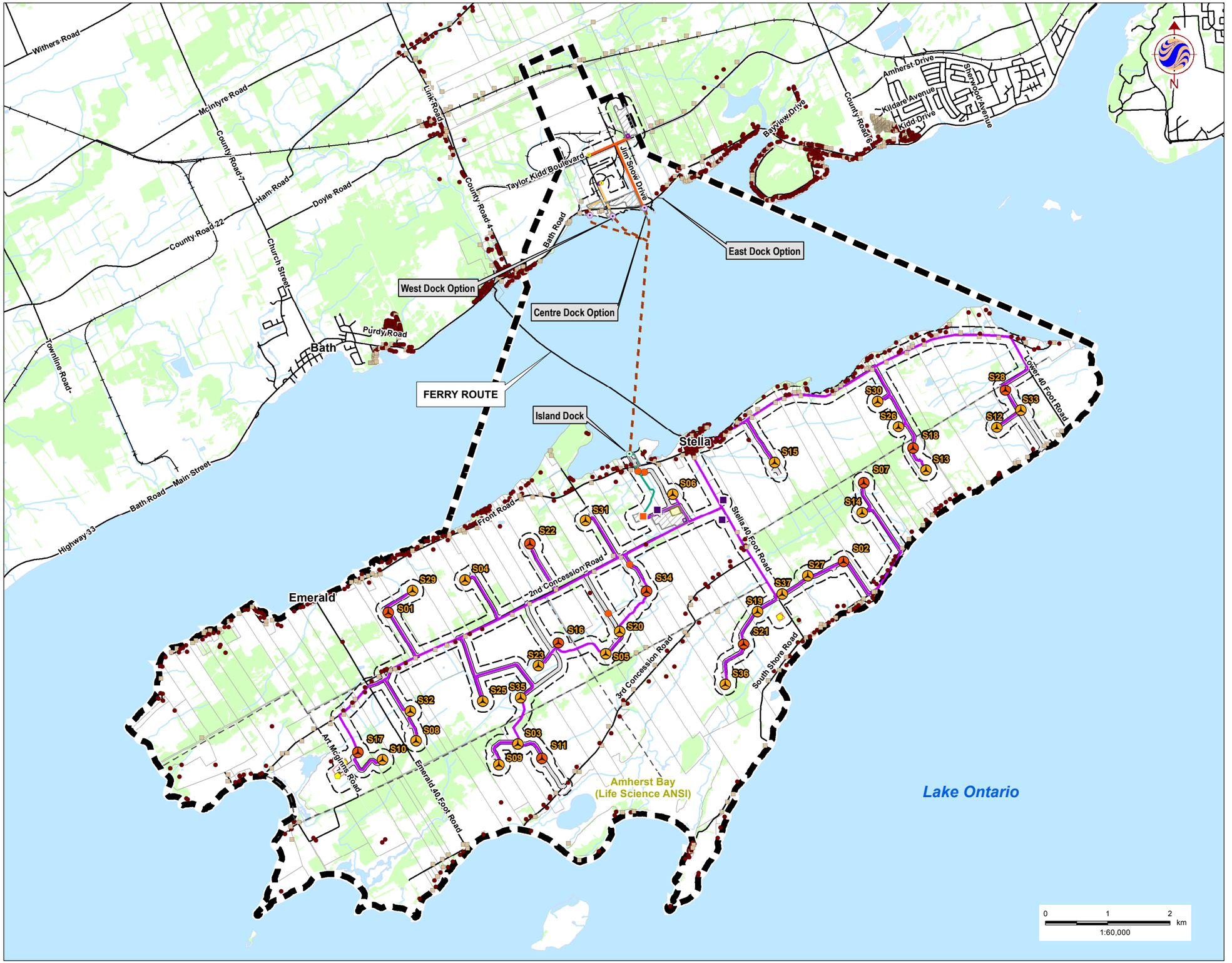
WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

1.5

Title

Significant Natural Features & Wildlife Habitat



Legend

- Project Study Area
- 120m Zone of Investigation

Project Components

- Turbine
- Turbine — *Subset of turbines selected for post-construction mortality monitoring*
- Met Tower (Potential Location)
- Substation (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)
- Storage Shed

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Noise Receptors

- Existing
- Vacant

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Waterbody
- Wooded Area
- Property Boundary

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

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WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

2.0

Title

Post-construction Mortality Monitoring Locations

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Revised: 2013-04-03 By: pworsell