

Appendix C

Summary of the Potential Environmental Effects and the Environmental Effects Monitoring Plan during Operations

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Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
Heritage and Archaeological Resources					
Protected Properties and Heritage Resources	<ul style="list-style-type: none"> Disturbance to viewscape. 	<ul style="list-style-type: none"> Minimize potential for visual disturbance 	<ul style="list-style-type: none"> See 'Viewscape' Use of appropriate landscape design. 	<ul style="list-style-type: none"> Minimal. 	<ul style="list-style-type: none"> See 'Viewscape'
Archaeological Resources	<ul style="list-style-type: none"> There are no areas that would be excavated during the operation phase that would not have been previously assessed prior to construction; therefore no effects are anticipated to archaeological resources during operation. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
Natural Heritage Resources					
Significant Wetlands	<ul style="list-style-type: none"> Accidental chemical and/or fuel spills and contamination. Infrequent day to day use of the access roads and maintenance activities resulting in dust generation. 	<ul style="list-style-type: none"> Manage the risk of accidental spills. Minimize disturbance to wetlands. 	<ul style="list-style-type: none"> Mitigation measures for spills include: <ul style="list-style-type: none"> Standard containment facilities and emergency response materials (spill kits) will be maintained on-site as required. Refuelling, equipment maintenance, and other potentially contaminating activities will occur in designated areas. In the event of a potential discharge of fluids associated with Project operation, the operation and maintenance contractor will immediately stop work and rectify the accidental spill. Once the spill is under control the contractor will remove contaminated soil and dispose of it in accordance with the current appropriate provincial legislation, such as Ontario Regulation 347, the General – Waste Management Regulation. The Emergency Response Plan will contain procedures for spill contingency and response plans, spill response training, notification procedures, and necessary cleanup materials and equipment. As per s. 13 of the Environmental Protection Act, all spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of prescribed regulatory levels should be reported to the MOE's Spills Action Centre. Other indirect effects to wetlands as a result of maintenance vehicle traffic and turbine operation are expected to be negligible and as a result, no mitigation is required. 	<ul style="list-style-type: none"> Detailed mitigation measures for the Project as provided in the <i>NHA/EIS</i> An Emergency Response and Communications Plan would be developed by Windlectric and/or the operation and maintenance contractor and would include protocols for the proper handling of material spills and associated procedures to be undertaken in the event of a spill. 	<ul style="list-style-type: none"> Minimized or avoided during operation.
Areas of Natural and Scientific Interest	<ul style="list-style-type: none"> Accidental spills and contamination. Infrequent day to day use of the access roads and maintenance activities resulting in dust generation. 	<ul style="list-style-type: none"> Manage the risk of accidental spills. Minimize disturbance to Areas of Natural and Scientific Interest (ANSI). 	<ul style="list-style-type: none"> See mitigation measures for spills under 'Significant Wetlands' Other indirect effects to ANSI as a result of maintenance vehicle traffic and turbine operation are expected to be negligible and as a result, no mitigation is required. 	<ul style="list-style-type: none"> Detailed mitigation measures for the Project as provided in the <i>NHA/EIS</i> An Emergency Response and Communications Plan would be developed by Windlectric and/or the operation and maintenance contractor and would include protocols for the proper handling 	<ul style="list-style-type: none"> Minimized or avoided during operation.

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				of material spills and associated procedures to be undertaken in the event of a spill.	
Valleylands	<ul style="list-style-type: none"> As no valleylands were identified, there are no anticipated impacts. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> None
Significant Woodlands	<ul style="list-style-type: none"> Accidental spills and contamination. Infrequent day to day use of the access roads and maintenance activities resulting in dust generation. 	<ul style="list-style-type: none"> Manage the risk of accidental spills. Minimize disturbance to woodlands. 	<ul style="list-style-type: none"> See mitigation measures for spills under 'Significant Wetlands' Other indirect effects to ANSI as a result of maintenance vehicle traffic and turbine operation are expected to be negligible and as a result, no mitigation is required. 	<ul style="list-style-type: none"> See mitigation measures for spills under 'Significant Wetlands' 	<ul style="list-style-type: none"> See mitigation measures for spills under 'Significant Wetlands'
Provincial Parks and Conservation Reserves	<ul style="list-style-type: none"> As no Provincial Parks and Conservation Reserves were identified, there are no anticipated impacts. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> None
Significant Wildlife and Wildlife Habitat (includes birds, bats, amphibians and other wildlife)	<ul style="list-style-type: none"> Possible avoidance or displacement of wildlife. Direct mortality of wildlife Sensory disturbance to wildlife. Accidental spills and contamination. Infrequent day to day use of the access roads and maintenance activities resulting in dust generation. 	<ul style="list-style-type: none"> Minimize disturbance to wildlife and wildlife habitat. 	<ul style="list-style-type: none"> Minimize maintenance vehicle traffic and human presence on access roads during grassland breeding bird season (May 1 to July 31). Turbine lighting must conform to Transport Canada standards. See mitigation measures for spills under 'Significant Wetlands' Other indirect effects to Significant Wildlife and Wildlife Habitat as a result of maintenance vehicle traffic and turbine operation are expected to be negligible and as a result, no mitigation is required. 	<ul style="list-style-type: none"> Post-construction monitoring in significant wildlife habitat and for mortality, as detailed in the Environmental Effects Monitoring Plan (Appendix D). Post-construction monitoring for disturbance will be conducted in all significant open country breeding habitat for a period of three years. An Emergency Response and Communications Plan would be developed by Windlectric and/or the Operation and Maintenance Contractor and would include protocols for the proper handling of material spills and associated procedures to be undertaken in the event of a spill. 	<ul style="list-style-type: none"> Minimized or avoided during operation.
Water Bodies and Aquatic Resources					
Groundwater	<ul style="list-style-type: none"> Accidental spills and contamination. No groundwater or surface water supplies are anticipated to be used for the facility. 	<ul style="list-style-type: none"> Manage the risk of accidental spills. No interference to surrounding private water wells or surface infrastructure. 	<ul style="list-style-type: none"> See mitigation measures for spills under 'Significant Wetlands' Above-ground potable and non-potable water tanks would service the operations and maintenance building, no water takings are required from local water sources. 	<ul style="list-style-type: none"> An Emergency Response and Communications Plan would be developed by Windlectric and/or the Operation and Maintenance Contractor and would include protocols for the proper handling of material spills and associated procedures to be undertaken in the event of a spill. 	<ul style="list-style-type: none"> Minimized or avoided during operation. No net effects are anticipated for water well usage (if one is required).
Surface Water, Fish, and Fish Habitat	<ul style="list-style-type: none"> Accidental spills and/or leaks. Erosion and sedimentation during maintenance activities. Submarine cables producing a weak magnetic field source. 	<ul style="list-style-type: none"> Manage the risk of accidental spills. Minimize the risk of erosion, and sediment transport. 	<ul style="list-style-type: none"> Any stockpiled materials should be stored and stabilized away from the water; Refuelling and maintenance of construction equipment should occur a minimum of 100 m from a water body; As appropriate, spills should be reported to the MOE Spills Action Centre; Any part of equipment entering the water should be free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the water; and Only clean material, free of fine particulate matter should be placed in the water. Silt fencing and/or barriers should be used along all construction areas adjacent to natural areas; No equipment should be permitted to enter any natural areas beyond the silt fencing during 	<ul style="list-style-type: none"> Environmental monitoring following spring run-off the first year of operations. An Emergency Response and Communications Plan would be developed by Windlectric and/or the operation and maintenance contractor and would include protocols for the proper handling of material spills and associated procedures to be undertaken in the event of a spill. Appropriate remedial measures may be completed as necessary and additional follow-up monitoring conducted as appropriate in the event of an accidental spill and/or leak. The level of monitoring and reporting should be based on the severity of the spill/leak and may be discussed with the MOE (Spills Action Centre) and MNR. 	<ul style="list-style-type: none"> Effects to surface water and water bodies would be both spatially and temporally limited to the maintenance activity. No significant negative effects are anticipated to surface water, water bodies and fish and fish habitat.

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Environmental Feature	Potential Effect	Performance Objective	Mitigation Strategy	Monitoring Plan and Contingency Measures	Net Effects
			construction; <ul style="list-style-type: none"> All sediment and erosion control measures should be inspected at least weekly and during and immediately following rainfall events to ensure that they are functioning properly and are maintained and/or upgraded as required; Topsoil stockpiles should be sufficiently distant from watercourses to preclude sediment inputs due to erosion of stored soil materials; If the sediment and erosion control measures are not functioning properly, no further work should occur until the sediment and/or erosion problem is addressed; All disturbed areas of the construction site should be stabilized immediately and re-vegetated as soon as conditions allow; and Sediment and erosion control measures should be left in place until all areas of the construction site have been stabilized. While a number of species are reported to be capable of detecting changes in the Earth's magnetic field, the narrow linear feature of the field around the cable makes it unlikely that long distance navigation, migration, or major behavioural patterns of those species would be affected. 	<ul style="list-style-type: none"> If <i>Fisheries Act</i> approvals are required from DFO, some monitoring may be required including photographic records during construction and for two years after the completion of construction. To ensure survival of plantings and overall function of the installations. 	
Air Quality and Environmental Noise					
Air Emissions	<ul style="list-style-type: none"> Emissions from operation and maintenance activities, including equipment and vehicles. 	<ul style="list-style-type: none"> Minimize duration and magnitude of emissions. 	<ul style="list-style-type: none"> Operation staff would operate vehicles in a manner that reduces air emissions to the extent practical, including: <ul style="list-style-type: none"> Using multi-passenger vehicles to the extent practical Avoid idling vehicles Equipment and vehicles would be maintained in a manner that reduces air emissions, including: <ul style="list-style-type: none"> Using mufflers and emission control systems as available; Meet the emissions requirements of the MOE and/or MTO; 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practical. 	<ul style="list-style-type: none"> Any net effects are expected to be short-term in duration and highly localized.
Dust & Odour Emissions	<ul style="list-style-type: none"> Dust emissions from operation and maintenance vehicles and unpaved road surfaces exposed to wind. 	<ul style="list-style-type: none"> Minimize duration and magnitude of emissions. Minimize disturbance to existing land uses. 	<ul style="list-style-type: none"> Maintaining equipment in good running condition and in compliance with regulatory requirements. Dust suppression (e.g. water) of source areas as necessary. Covering loads of friable materials during transport. 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> Any net effects are expected to be short-term in duration and highly localized.
Environmental Noise	<ul style="list-style-type: none"> Noise emitted from a turbine and/or transformers. Noise emitted from traffic and /or vehicles during maintenance activities. 	<ul style="list-style-type: none"> Noise at all non-participating receptors to meet MOE Noise Guidelines. 	<ul style="list-style-type: none"> Adherence to all noise setback requirements. All engines on vehicles associated with maintenance equipment would be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations. Noise levels arising from maintenance equipment would also be compliant with sound 	<ul style="list-style-type: none"> Routine facility maintenance to ensure infrastructure is operating properly and efficiently would be performed as required Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> Application of the recommended mitigation measures during operations would limit noise emissions to the general vicinity of the turbine locations and substation property.

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			levels established by the MOE. <ul style="list-style-type: none"> Routine maintenance to ensure Project infrastructure is operating properly and effectively. To the greatest extent possible, operations activities that could create excessive noise would be restricted to operation business hours. If maintenance activities that cause excessive noise must be carried out outside of these time frames, discussion and authorization from the Township will be required. A sound attenuation wall will also be constructed around three sides of the substation transformer to further attenuate noise produced by the Project. 		<ul style="list-style-type: none"> Given that the facility must comply with MOE environmental noise requirements, no significant net effects are anticipated. Any adverse net effects due to noise during maintenance activities are anticipated to be short-term in duration and intermittent.
Land Use and Socio-Economic Resources					
Existing Land Uses	<ul style="list-style-type: none"> Lands occupied by Project components would be removed from their present land-use. Minimal impacts to livestock are anticipated. Temporary limited increase in noise and dust levels during maintenance activities. Potential for minor increase in traffic during maintenance activities. 	<ul style="list-style-type: none"> Minimize disturbance to existing land uses. Minimize land required for the Project. Eliminate potential stray voltage. 	<ul style="list-style-type: none"> Operational and maintenance activities would be restricted to areas where Project components are located. Siting of turbines will comply with MOE guidelines. Landowners are being financially compensated for the lease of the private lands and thus offset the effect of removing the land from agricultural production. Siting of turbines and access roads is completed in consultation with the participating landowners. Siting of turbines, access roads, collector lines, and the transmission line in such a way as to minimize disturbances to existing agricultural operations. All electrical collector lines would be installed to meet the Ontario Electrical Safety Code and be certified by the Electrical Safety Authority. See 'Environmental Noise', 'Dust and Odour Emissions', and 'Local Traffic'. 	<ul style="list-style-type: none"> See 'Environmental Noise', 'Dust and Odour Emissions', and 'Local Traffic'. Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> Short-term in duration, temporary, and highly localized Minimized through the implementation of good site practices, transportation planning, and communication with the community.
Mineral, Aggregate, and Petroleum Resources	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> None
Game And Fishery Resources	<ul style="list-style-type: none"> Sensory disturbance to game species from limited noise. Possible barriers to fish passage from improperly installed culverts. 	<ul style="list-style-type: none"> Minimize disturbance to game and fishery resources. 	<ul style="list-style-type: none"> Siting the Project outside of wetlands and naturally vegetated areas has largely precluded disturbance to local flora, small mammals and amphibians, natural habitat, and corridor functions. Routine maintenance to ensure equipment is operating properly and efficiently, thus limiting potential disturbance to game resources. Current agricultural, recreational and hunting activities provide some disturbance. It is anticipated, similar to other wind projects, that game resources will adapt to the presence of operational turbines. Hunting and other recreational uses will be 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> None

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			permitted on lands occupied and adjacent to the Project (not withstanding private property restrictions). <ul style="list-style-type: none"> • Culverts would be designed and installed such that there is no restriction of flows through the culvert. 		
Provincial Plans, Policies, and Recreation Areas	<ul style="list-style-type: none"> • Possible interference with nearby recreational uses from traffic, dust and noise. 	<ul style="list-style-type: none"> • Minimize disturbance to recreational activities. 	<ul style="list-style-type: none"> • Mitigation measures related to noise are outlined in '<i>Environmental Noise</i>'. • Mitigation measures related to dust are outlined in '<i>Dust and Odour Emissions</i>'. • Mitigation measures related to traffic are outlined in '<i>Local Traffic</i>'. 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • Any adverse effects are anticipated to be short term and intermittent.
Local Traffic	<ul style="list-style-type: none"> • Short-term, localized disturbance to traffic patterns, increases in traffic volume, and/or creation of potential traffic safety hazards. 	<ul style="list-style-type: none"> • Minimize disturbance to local traffic. 	<ul style="list-style-type: none"> • As appropriate, the Proponent would obtain relevant permits related to traffic planning. • Follow the Traffic Management Plan used during Construction, as required during maintenance activities. 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. • Communication with Township and community. 	<ul style="list-style-type: none"> • Temporary and intermittent.
Local Economy	<ul style="list-style-type: none"> • Small increase in direct, indirect and induced employment over the operations period. • Local economic benefits from land lease payments, local expenditures, municipal taxes, etc. 	<ul style="list-style-type: none"> • Create positive effects on local economy. 	<ul style="list-style-type: none"> • To the extent practicable required goods and services would be sourced from qualified local suppliers where these items are available in sufficient quantity and quality and at competitive prices. 	<ul style="list-style-type: none"> • Adherence to the Complaint Response Protocol. 	<ul style="list-style-type: none"> • A positive net effect is anticipated on the local economy during operation of the Project. • Participating landowners would receive land payments based on agreements with the Proponent. • Township has been offered a draft Community Vibrancy Agreement (which is currently being review by the Township). • Existing businesses in the local communities could benefit from the demands of the Project workforce during operations.
Viewscape	<ul style="list-style-type: none"> • Disruption to viewscape from siting of Project infrastructure. 	<ul style="list-style-type: none"> • Minimize potential for visual disturbance. 	<ul style="list-style-type: none"> • The operation and maintenance building construction and finishes would be chosen to be compatible with the rural setting of the General Project Area and other buildings in the locale. • The substation and switching station may be surrounded by berms to mitigate the visual impact of the site. • Consideration of fewer lights and exploration of lighting technologies, however the Project must remain compliant with Transport Canada requirements. • Limited opportunities for potential mitigation strategies given the height of the wind turbines 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • The changed visual landscape would be present during the life of the facility. • Will be a net effect (either positive or negative based on perceptions) due to the change in viewscape of the surrounding area.

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Existing Infrastructure					
Provincial and Municipal Infrastructure	<ul style="list-style-type: none"> • May be instances during maintenance activities where excess loads would require special traffic planning. • See 'Local Traffic'. 	<ul style="list-style-type: none"> • Minimize disturbance to provincial, municipal, and other major infrastructure. 	<ul style="list-style-type: none"> • Necessary permits would be obtained. • Consultation with Township regarding excess loads required during operation that have potential to damage municipal roads. 	<ul style="list-style-type: none"> • See 'Local Traffic' • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • Potential for damage due to excess loads required for maintenance activities cannot be totally disqualified. • Limited, short-term effect on infrastructure.
Navigable Waters	<ul style="list-style-type: none"> • Temporary activity due to crossings during maintenance activities. 	<ul style="list-style-type: none"> • Avoid navigable waterways. • Minimize length of disturbance to navigable waterways. 	<ul style="list-style-type: none"> • Consultation with Transport Canada and permits (if required) will be obtained prior to construction. 	<ul style="list-style-type: none"> • To be identified as part of any permits (if required). 	<ul style="list-style-type: none"> • None
Telecommunication and Radar Systems	<ul style="list-style-type: none"> • Potential to interfere with telecommunication and radar systems 	<ul style="list-style-type: none"> • Minimize interference with radio, TV, or internet signals. • Minimize interference with cellular telephone networks 	<ul style="list-style-type: none"> • The Proponent has consulted with relevant agencies and licensed providers to identify any likely effects to telecommunication and radar systems. • In the unlikely event that signal disruption is experienced, mitigation measures may include: <ul style="list-style-type: none"> ○ Replacing the receiving antenna with one that has a better discrimination to the unwanted signals, ○ Relocating either the transmitter or receiver, or ○ Switching to an alternate means of receiving the information. 	<ul style="list-style-type: none"> • The Proponent would review potential incidents of telecommunications interference on a case by case basis. • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • Limited and short-term in duration.
Aeronautical Systems	<ul style="list-style-type: none"> • Aeronautical obstruction. 	<ul style="list-style-type: none"> • Minimize potential hazard to low flying aircraft. 	<ul style="list-style-type: none"> • Turbine lighting must conform to Transport Canada standards. In order to reduce rural light pollution, lights would be selected with the minimal allowable flash duration, narrow beam, and would be synchronized. • NAV Canada would be responsible for updating all aeronautical charts with the turbine locations promptly after Project approval. • Low-level aircraft such as ultra-lights and crop dusters are to be familiar with the area they are flying over and are prohibited from night-time flights. 	<ul style="list-style-type: none"> • Adherence to marking and lighting requirements of the Aerodrome Safety Branch of Transport Canada. • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • No anticipated significant effects to aeronautical systems. • Low-level aircrafts may need to re-route their flight paths or consult with Windlectric when spraying is to occur.
Public Health and Safety					
Public Health and Safety	<ul style="list-style-type: none"> • Potential traffic safety hazards. • Turbine Blade and Structural Failure • Ice fall and shed • Extreme Weather Events 	<ul style="list-style-type: none"> • No structural failure of the turbines or ancillary equipment. • Limit potential for ice throw/shed to impact pedestrians • No structural failure of the turbines or Project equipment. 	<ul style="list-style-type: none"> • Implementation of an Emergency Response Plan. • Follow the Traffic Management Plan used during Construction, as required during maintenance activities. • Design, install, operate, and maintain turbines according to current applicable industry standards/certifications. • Turbine control systems are subjected to rigorous specification in the design standards for wind turbines (IEC 61400-1) and exhaustive analysis in the certification process. 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. • Failsafe devices are capable of shutting down the turbine blades in the event of excessive wind conditions, imbalance or malfunction of other turbine components. • Turbines would be monitored electronically twenty-four hours a day, seven-days a week, to allow operational changes to be noted and assessed quickly. • Turbine maintenance to ensure turbines are running properly and efficiently. 	<ul style="list-style-type: none"> • With adherence to safety policies and procedures, there is minimal increased or new risk to public health and safety

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			<ul style="list-style-type: none"> • Turbines with industry certification must have a safety system completely independent of the control system. In the event of a failure of one system, the other is designed to control the rotor speed. • Training and education of staff operating the control system. • Adherence to required setbacks. • Design of turbine tower reduces ice accumulation. • Automatic turbine shutdown due to weight imbalances. • Project components have been designed to withstand the effects from extreme events. • Design, install, operate, and maintain turbines according to applicable industry standards/certifications. • Turbines are designed to automatically shut down in the event of excessive wind conditions, imbalance, or malfunction of other turbine components. 	<ul style="list-style-type: none"> • Inspections of turbines would occur after extreme weather events. 	