AMHERST ISLAND WIND ENERGY PROJECT

CONSTRUCTION PLAN REPORT

File No. 160960595
April 2013
Revised December 2013

Prepared for:

Windlectric Inc.
2845 Bristol Circle,
Oakville, ON L6H 7H7

Prepared by:

Stantec Consulting Ltd.
Suite 1 - 70 Southgate Drive
Guelph ON N1G 4P5

Table of Contents

List of Tables

List of Appendices

1.0 Introduction

1.1 PROJECT OVERVIEW

Windlectric Inc. (the Proponent or Windlectric) is proposing to develop, construct, and operate the 56 - 75 megawatt (MW) Amherst Island Wind Energy Project (the Project) within Loyalist Township (the Township) in the County of Lennox and Addington (the County) in eastern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province.

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 the Renewable Energy Approval (REA). The layout includes 24 Siemens SWT-2.3-113 2300 kW and twelve (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.

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. The electrical power line collector system would transport the electricity generated from each turbine to the substation, along the submarine cable to the mainland and then to a switching station located near to an existing Hydro One Networks Inc. (HONI) 115 kV transmission line.

The Proponent has elected to assess and seek approval for some alternative Project configurations. The REA application process will consider:

- two alternative mainland transmission line routes;
- two alternative switching station locations and corresponding point of common coupling with the HONI line;
- three alternative mainland temporary dock locations along the mainland;
- a submarine cable with three alternative submarine cable routes near the mainland;

- three alternative mainland submarine cable landing locations and corresponding cable vault locations;
- up to three alternative met tower locations; and,
- up to three potential locations for an operations and maintenance building.

Final selection of the sites to be used would be based on the results of consultation activities, detailed design / engineering work, and the conditions experienced during construction.

Windlectric has retained Stantec Consulting Ltd. (Stantec) to prepare a Renewable Energy Approval (REA) application, as required under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). According to subsection 6(3) of O. Reg. 359/09, this Project is classified as a Class 4 Wind Facility. The *Draft Construction Plan Report* is one component of the REA application for the Project, and has been prepared in accordance with O. Reg. 359/09, and the Ministry of the Environments' (MOE) *Technical Guide to Renewable Energy Approvals* (MOE 2011).

1.2 REPORT REQUIREMENTS

The purpose of the *Draft Construction Plan Report* is to provide the public, Aboriginal communities, municipalities, and regulatory agencies with an understanding of the Project construction plan, including any environmental effects that may result from Project construction.

The *Draft Construction Plan Report* has been prepared in accordance with Item 1, Table 1 of O. Reg. 359/09 and the Ministry of the Environment's (MOE's) guidance document *Technical Guide to Renewable Energy Approvals.*

The following table summarizes the requirements of this report as specified under O. Reg. 359/09:

Table 1.1: Construction Plan Report Requirements (as per O. Reg. 359/09 – Table 1)

Requirements	Section Reference
Set out a description of the following in respect of the renewable energy project:	
1. Details of any construction or installation activities.	2.0
2. The location and timing of any construction or installation activities for the duration of the construction or installation.	2.0
3. Any negative environmental effects that may result from construction or installation activities.	3.0
4. Mitigation measures in respect of any negative environmental effects mentioned in paragraph 3.	Appendix B

2.0 Construction and Installation Activities

This section provides a description of construction and installation of the Project components. A detailed description of the Project components is provided in the *Draft Project Description Report*.

The following table (2.1) provides a detailed description of the activities that will occur as part of the construction phase of the proposed Project and are typical for this type of project. All Project components to be installed including the temporary lands to be used for construction purposes are also described and are shown on the figures provided in **Appendix A**. Post-installation activities such as restoration of vegetation are detailed in Section 3.0.

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
Land Surveying and Geotechnical Assessment	• A registered Ontario Land Surveyor (or equivalent) will survey and stake all access roads, collector lines, transmission lines and turbine locations as appropriate. • Temporary work locations (i.e. the constructible area) will also be surveyed and staked, on private lands, to ensure construction vehicles and personnel stay within the demarcated areas. • Detailed geotechnical work will be conducted prior to Project construction, the details of which will be determined during the detailed design and are not required in the REA submission. Note: preliminary geotechnical work was completed to obtain general subsurface information within the vicinity of the Project Location. It was found that the soil and bedrock conditions are conducive for design and construction of the proposed Project. • Develop agreements with utility companies, if required, for the temporary relocation or adjusted location of utilities within the Project Location or transportation routing (i.e. low slung electrical collector lines that impede the flow of equipment may need to be lifted).	• Pickup trucks • SUVs • ATVs • Tracked drill rig • Trailer with water tank	• N/A
Equipment, Materials and Component Delivery	• Project equipment, materials and components are delivered by trucks, oversized tractor trailers, rail, and/or barge.	• Pick-up Trucks, dump • Trucks (i.e. duel axle) • Oversized tractor trailers	• N/A

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
		• Rail car • Civil barge (51 m x 12 m) • Large component barge (99 m x 12 m) • Flatbed trailers • Cranes • Fork lifts • All terrain lifts	
Site Preparation	• Temporary crane paths and staging areas will be prepared. • The following staging areas will not be graveled. They may have top soil removed. If so it will be removed and stock piled, and the subsoils will be compacted. o Crane paths o Access road staging area o Met Tower staging area o Roadside collector and transmission line staging area o Central staging area • The turbine staging area will not have topsoil removed, except for the crane pad and where the turbine components will be laid down. • Temporary facilities such as trailers and portable toilets would be installed. • Excavations will be completed for the septic system at the operations and maintenance building, equipment and building foundations, cable vaults and underground utilities. • Surface material will be stripped, stockpiled and reused to on site as needed. • Site grading will be completed as necessary. • Following construction all temporary locations would be rehabilitated to pre-construction conditions. • Erosion and runoff controls would be installed at runoff pathways to protect surface waters during construction activities. • Natural features requiring protection will be marked and silt fencing placed around them. • Trees that require trimming/removal would be conducted in compliance with the Township tree cutting by-law, if applicable. • The public roads will be examined to determine if any necessary	• Tractor-scrapers • Compactors • Excavators • Dozers	• None

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
	engineering road upgrades (i.e. load analysis determination and infrastructure improvements, rock anchoring) are required to ensure transportation of the equipment can be maintained safely.		
Access Roads	• Access roads will be approximately 4-6 m wide and will not require resizing for the operation phase, with the exception of the entrances off Township or County roads that require wider turning radii, of approximately 50 m, during construction. • The staging area for access roads will be approximately 10 m (includes additional area for access road movement and workspace for construction purposes) • Some access roads require turnaround areas for delivery trucks. These turnaround areas will be the same width as the access roads, constructed in the same manner and include the same requirements for staging areas. • The staging area for entrances off Township or County roads will be approximately 50 m. • Surface material will be stripped, stockpiled and reused to on site as needed. • No site preparation is required for access road staging areas (provided they are in safe working condition). However, locations where turbine components are temporarily stored; these areas will be restored following turbine erection to pre-existing conditions. • Access roads will be constructed of engineered compacted fill and/or soil stabilization material. The depth of the roadbed will be approximately 200-350 mm. Construction will typically consist of Granular 'B' base material topped with crushed gravel (Granular 'A'). Alternatively, soil stabilizer will be utilized with a reduced granular material depth. • Any new openings across existing fences will be fitted with suitable gates in consultation with the landowner. • Following construction all temporary locations would be rehabilitated to pre-construction conditions. •	• Compactors • Excavators • Dozers • Dump trucks • Backhoe • Grader • Roller	• Native material or engineered fill to the extent possible • Drainage tile • Granular A • Granular B

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
Culvert Installations	• Install culverts along access roads and associated underground collector and data lines that cross watercourses. • Construction will follow best management practices for culvert installation and permit specifications from the Cataraqui Region Conservation Authority (CRCA) and/or the Department of Fisheries and Oceans (DFO). • The culverts would be appropriately sized to meet flow conditions, embedded within the natural channel and backfilled with gravel to match the final grade of the access road. Other technical requirements may influence culvert size and materials. • Collector and data cables will be installed below the culverts where associated with an access road crossing, with the design determined by the construction contractor in consultation with the CRCA as appropriate.	• Backhoe • Grader • Roller	• Culverts • Native material or engineered fill to the extent possible
Turbine Laydown	• Turbine laydown (prior to turbine erection) will take place adjacent to each turbine location and has been incorporated into the Project Location design by designating a turbine staging area, approximately 100 m x 100 m, around each turbine location. • Following construction all temporary locations would be rehabilitated to pre-construction conditions.	• Excavator • Dozer • Compactor	• Native material or engineered fill to the extent possible • Turbine tower, nacelle, blades and hub
Crane Pads	• Crane pads, approximately 25 m x 60 m, will be constructed within the turbine staging area. The crane pads will typically consist of the same make up as the access roads. • A crane platform (where the crane sits) may consist of a heavier granular material or soil stabilizer depending on site conditions. Temporary laminated crane mats would be used under each of the crane stabilizer arms. • Following construction all temporary locations would be rehabilitated to pre-construction conditions.	• Excavator • Dozer • Dump Trucks • Compactor	• Native material or engineered fill to the extent possible • Alternatively, cement/soil stabilizing agent
Turbine Foundation	• Surface material will be stripped, stockpiled and reused to the extent possible during site landscaping. • Foundations are made of cast in situ reinforced concrete and rock anchors, if it is feasible.	• Excavator • Dozer • Concrete trucks • Concrete pump trucks • Compactor	• Concrete • Grounding wire • Rebar • Steel Piles • Formwork

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
	• Final foundation design to be based on site specific geotechnical assessment. Foundation designs are likely to be octagonal or circular in shape. • Foundations will be approximately 6-19 m in diameter (depending on subsurface conditions). • The excavated area will be approximately 10-25 m. • Excavation takes approximately 3-12 days per foundation. • Foundations are expected to be approximately 2-5 m deep. • Based on site specific conditions, blasting may be required to assist with excavations. If a significant amount of rock is encountered, the rock removed would be crushed in an on-site crusher and, as appropriate, used for backfill, laydown areas or spread in agreement with the landowner. • Any excess soil will be spread in areas agreed with the landowner. • Formwork and reinforcing steel would be installed followed by the concrete pour. • Concrete will be transported on site and poured via concrete truck mixers [• The turbine and associated electrical equipment will be grounded for safety purposes. • Excavations will be back filled and compacted with select fill and native subsoil. • Construction of each foundation is completed within approximately 2 weeks (pending weather conditions). • The foundation needs to cure for up to 28 days for the concrete to reach design strength prior to erection of the turbine.	• Dump Trucks	
Turbine Transformers	• Padmount transformers will be located at the base of each wind turbine. • A separate precast or cast in place concrete pedestal would be installed to house the padmount transformer. • The transformers will be approximately 2 m x 2 m. • No site preparation is required except for excavating the void for the concrete pedestal. • Surface material will be stripped, stockpiled and reused to the extent possible during site landscaping. • Gravel is deposited and packed where	• Flatbed truck and trailer • Small crane • Excavator • Concrete truck	• Precast or cast concrete pedestal • Concrete bollards (potentially) • Pad mount transformers

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
	the concrete pedestal will be placed. • The padmount transformer will be delivered by flatbed truck and trailer. A small crane will be used to lift the padmount transformer from the truck and place it onto the concrete pedestal. • The padmount transformer and associated electrical equipment will be grounded for safety purposes. • Bollards may be installed to protect the padmount transformer.		
Turbine Assembly (including Crane Paths)	• The towers will be delivered to each turbine site in sections and assembled using a heavy-lift crawler and mobile cranes. • The towers will be bolted together on site. • After erection of the towers, the nacelle will be installed on the top of the tower using a heavy-lift crane. • The rotor, which consists of the hub and three blades, will be installed after the nacelle is in place using a heavy lift crane and a small crane which stabilizes the components as they are being lifted. • The movement of the cranes between turbine sites (i.e. crane paths) will take place along the access and municipal roads. In the event that cross field crossings are utilized, the crossings will be restricted to follow the underground collector line routes, and have a constructible width of 10 m. Timber crane mats and/or steel plates may be used where required to facilitate the crane moving through soft or wet areas. Crane paths not located on roads will be rehabilitated to pre-construction conditions. • Temporary laminated crane mats would be used under each of the crane stabilizer arms. • The turbine steel base is anchored to the concrete foundation using embedded steel ring and foundation anchor bolts. • Following erection of the turbines, they will be connected to the collector lines.	• Heavy lift crane • Mobile cranes (stabilizing crane)	• Temporary use of timber, crane mats and/or steel plates.
Collector Lines and Data Cabling	• From each turbine, 34.5 kV underground and/or overhead collector lines carry the electricity to the Project's substation. • Collector lines will be buried	• Excavator • Utility bucket truck • Auguring truck • Pole trailer • Reel stand	• Wooden utility poles • Electrical cables • Electrical

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
	underground or installed overhead on private property from the turbine to the municipal ROW. • Underground lines are buried at a minimum depth of 1.2 m so that agricultural production can continue on the lands above the collector lines. The underground trench will be backfilled with sand. • Overhead lines, if used, will be constructed on wooden poles similar to distribution lines in the area. • Data cabling, if installed, would run with the collector lines, both above and below grade. When installed with underground collector lines, the data cabling will be laid on top of the sand, clean excavated material will be backfilled and compacted on top of the collector lines and data cabling bedding. • Where necessary, partially buried junction boxes will be placed at the junction where the collector line from the turbine meets the collector line in the road allowance. Junction boxes will require an excavation of approximately 0.5 m long x 0.5 m wide with approximately 0.5 m above ground. • Excavations will be back filled and compacted with select fill and native subsoil. • Splices will be installed in underground vaults or direct buried	vehicles • Conductor puller vehicle • Tensioner vehicle • Lineman trucks • Dump truck • Compactor	conduit • Junction boxes • Bedding sand/ material • Collector lines and data cabling lines
Substation	• The substation will consist of a prepared area of approximately 80 m x 100 m in size. • Surface material will be stripped, stockpiled and reused to the extent possible during site landscaping. • A chain link fence will be installed to enclose the substation. • A grounding grid will be built within the fenced area. • Cranes would be used for transformer and switchgear placement. • A concrete containment foundation with an oil/water separator will be installed around the transformer that will be large enough to hold any insulating fluid that may leak from the equipment. • A sound attenuation wall will be installed around three sides of the transformer to minimize the escape of	• Dozer • Dump truck • Gravel truck • Concrete truck mixers Excavator • Grader • Backhoe • Roller • Cranes • Flatbed truck • Compactor	• Engineered fill and crushed stone • Concrete • Chain link fence • Sound attenuation wall • Grounding Grid • Electrical transformers & spill containment • Formwork • Rebar • Transformer • Switchgear

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
	noise into the surrounding environment. Wall minimum density will be 20kg/m² that will break the line of sight with any adjacent noise receptors. • The transformer and switchgear will be delivered to the site by flatbed trucks and lifted by cranes and positioned onto the concrete foundations. • Excavations will be back filled and compacted with select fill and native subsoil.		
Operations and Maintenance Building	• The operation and maintenance building will be situated on a building area of approximately 1100m$^{2.}$ (entire operation and maintenance building footprint is approximately 4900 m$^{2).}$ Along with onsite storage and parking space. • Surface material will be stripped, stockpiled and reused to the extent possible during site landscaping. • The building will be a prefabricated engineered structure. • The facility will be enclosed with a chain link fence. • A fiber optic cable will be installed in conjunction with the collector line system and connect to the operation and maintenance building. • An underground septic tank and aboveground non-potable water tank will be installed on site. • An above ground potable water tank will be installed that will be replenished as required by a licensed hauler. • Excavations will be back filled and compacted with select fill and native subsoil. • Waste materials from construction will be delivered to the operations and maintenance building. • A landscape plan will be developed and submitted to the Township for consideration • Lighting requirements (in order to minimize) for the building will be assessed (taking into consideration safety requirements)	• Dozer • Dump truck • Gravel truck • Concrete truck mixers • Front end loader • Excavator • Grader • Backhoe • Roller • Cranes • Flatbed truck • Compactor	• Engineered fill and crushed stone • Concrete • Chain link fence
Temporary Batch Plant	• The batch plant area will be approximately 120 m x 150 m.	• 6-10 concrete truck mixers • Tractor/trailers	• Grading • Concrete slab for equipment • Access road

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
Temporary Site Office(s)	• The prepared area for the site office(s) will be approximately 50 m x 50 m • The area surrounding the site office(s) will serve as an area for parking. • The temporary site office(s) will be constructed using modular trailers.	• Pick –up trucks • Cars • Service vehicles	• ATCO type trailers • Portable washrooms • Gravel area for parking • Access road
Transmission Line	• The transmission line will be installed either underground or overhead. • Transmission line structures along roadways will be founded on individual concrete footings. The foundations likely consisting of concrete caissons. • If installed underground, the cable will be laid in trenches approximately 1.0 m x 1.5 m. The cables would be bedded in crushed limestone, or similar bedding material, as necessary and the trench would be backfilled with the excavated material. Warning tape would be installed along the length of the underground cable, approximately 300 mm above the cables. The ground will be compacted to reinstate the original ground level, as reasonable, after installation of the cables. • For above ground construction, existing power line corridors would be used where possible. Existing poles may be replaced with taller poles to allow for the addition of new lines. New poles would be installed using linemen trucks with mounted augers. Following installation of poles and hardware the new cabling will be strung. • Potential installation of a wood “H” frame structure with two vertical poles and one cross bar near the top. Concrete footings would be required for each of the vertical poles approximately 0.5m – 1m diameter by 1.0 m – 1.5m deep • Excavated material from each pole is usually spread around the base of the pole. • Excavations will be back filled and compacted with select fill and native subsoil. • Splices will be installed in underground vaults or direct buried	• Utility bucket truck • Auguring truck • Pole trailer • Reel stand vehicle • Conductor puller vehicle • Tensioner vehicle • Linemen trucks	• Wooden utility poles • Concrete • Electrical conduit • Bedding sand/ material • Transmission lines

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
Submarine Cable	• The 115 kV submarine cable having portions of the cable having galvanized steel armour near the shoreline and under a section of the Ministry of Transportation easement. • There could be a potential of having buried conduits, near the shoreline (mainland and island) at the two landfall locations of the cable and the two submarine cable ends will be pulled through the conduits into concrete cable vaults. • Any excavations along private land, for the cable vaults and cable landfalls, will be back filled and compacted with select fill and native subsoil.		
Island Dock	• The type of dock to be constructed has not been finalized. Three options are being considered. Construction will be completed in consultation with the DFO. • During installation piles will be driven into lake bottom and level at pile caps or with a steel frame on rock lake bottom with concrete slab decking. • The platform will be constructed of a light steel frame (or wood), concrete slabs and/or backfilled with gravel. • All options require a concrete abutment.	• Small crane • Excavator • Dozer • Concrete trucks • Jack-up barge (possible)	• Concrete abutment • Gravel • Rebar
Temporary Mainland Dock	• During installation piles will be driven into lake bottom and level at pile caps or with a steel frame on rock lake bottom with concrete slab decking. • The platform will be constructed of a light steel frame, concrete slabs and/or backfilled with gravel. • The dock requires a concrete abutment.	• Small crane • Excavator • Dozer • Concrete trucks	• Concrete abutment • Gravel • Rebar
Storage Shed	• A storage shed will be installed on a building area of approximately 145 m x 200 m. • The building will measure approximately 6 m x 8 m. • The building is anticipated to be a prefabricated engineered structure with a concrete foundation.	• Pickup truck	• Pre-fab shed • Gravel parking • Access road
Met Tower(s)	• Surface material will be stripped, stockpiled and reused to the extent possible during site landscaping. • The met tower foundation design is dependent on ground conditions and is typically a steel reinforced concrete-filled pedestal foundation. The met tower(s) will either be freestanding	• Pick-up truck • Crane	• Native material or engineered fill to the extent possible • Framework • Rebar

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
	supported entirely by the foundation or would have guy wires for lateral support anchored with reinforced buried concrete. • 1-3 permanent met tower(s) either 60 m or 100 m high will be installed for use during the operation stage of the Project. • The 100 m met tower foundation will be approximately 5 m x 5 m, and its associated anchor blocks (if required) will be approximately 2 m x 2 m. • The 60 m met tower will be approximately 1 m x 1 m, and its associated anchor blocks (if required) will be approximately 1 m x 1 m. • Access roads will be constructed for installation of the met tower(s). • The staging area for the met tower(s) will be approximately 150 m x 150 m for a 100 m met tower(s) and approximately 100 m x 100 m for a 60 m met tower. • Sections of the met tower(s) will be delivered to the site by an appropriately sized pick-up truck and would be installed by crane. • Excavations will be back filled and compacted with select fill and native subsoil.		• Concrete
Switching Station	• The switching station will consist of a prepared area of 2500m^2 in size. • A grounding grid will be built within the prepared base. • Surface material will be stripped, stockpiled and reused to the extent possible during site landscaping. • A concrete containment foundation with an oil/water separator will be installed around the transformers that will be large enough to hold any insulating fluid that may leak from the equipment. • The power will tie into the adjacent Hydro One 115 kV transmission line. • Excavations will be back filled and compacted with select fill and native subsoil.	• Dozer • Dump truck • Gravel truck • Read-mix concrete trucks.	• Engineered fill and crushed stone • Concrete • Grounding grid • Electrical transformers and spill containment • Formwork • Rebar • Transformers • Switchgear

Table 2.1: Construction and Installation Activities

Activity	Description of Activities	Construction Vehicles	Materials Required
Site Completion and Restoration	• Removal of surplus material, equipment and debris. • Following construction all temporary locations would be rehabilitated to pre-construction conditions. • Any landscaping, re-vegetation or erosion control measures would be installed in accordance with detailed design.	• Dump truck • Excavator • Trim dozer • Trailer	• Landscaping mats • Seed •

2.1 TRAFFIC MANAGEMENT PLAN

A Traffic Management Plan will be developed in consultation with the construction contractor, Proponent, Township, County and any other required agencies to identify and plan for specific traffic planning needs including the management of traffic and the delivery of materials. The Traffic Management Plan will include details on the size and number of construction vehicles, and the timeline and operational plan for transporting materials to the Project Location. The plan would be developed prior to construction, during the detailed design phase, once the construction contracts have been awarded. The plan will be updated as required to adjust for changes such as road construction and the time of delivery.

The turbine manufacturer will be responsible for the transportation of all wind turbine components to the laydown area on the mainland. The manufacturer would develop a detailed Transportation Plan for delivery of the turbine components to the individual turbine sites. They would also be responsible for securing any necessary transportation and safety permits. Along the transportation route, intersections may require road widening to accommodate turning radius of the transportation vehicles (to be determined as part of the transportation study). Windlectric will pay for any temporary or permanent road widening activities and structural upgrades. Once the full road requirements have been finalized, detailed plans including maintenance of the municipal roads will be developed with the County and Township as appropriate.

2.1.1 Turbine Delivery

Turbine components will be transported to laydown areas on the mainland and island using oversized tractor trailers, rail and/or barge.

If rail is used to transport tower sections to the mainland laydown areas it is anticipated that four (4) trains with 45 cars each will be required. Based on the rail configuration adjacent to the laydown areas trains will be offloaded three (3) to four (4) cars at a time and local shunting equipment will be used to move rail cars.

All turbine components will be transported across the North Channel on a barge (unless direct barging from a component manufacturer to the island is selected as an option for some components).

The maximum amount of truck traffic on the mainland will occur if all turbine components are transported by tractor trailers to the laydown areas. Should this occur, a total of approximately 11 truck round trips per turbine will be required to transport the turbine components to the laydown areas on the mainland, and an associated approximately 100-130 barge round trips would be required to transport those materials to the island laydown area.

The amount of truck traffic on the island, approximately 11 truck round trips per turbine, is the same regardless of how the turbine components travel to the island laydown area.

The Traffic Management Plan will include mitigation measures for public safety and to address traffic flow.

Although there are no requirements for formal public notification of wind turbine component load movements, the Proponent will provide notification of non-conventional load movements that may significantly interfere with local traffic, with potential methods of notification including postings on the Project website. This notification would be provided in the interest of public safety and minimization of disruption of other road users.

2.1.2 Delivery of Other Project Materials

Construction equipment will be transported on flatbed trailers to and from the mainland laydown areas, the island laydown area, substation location, operations and maintenance building location, and between the wind turbine sites. No heavy haul trucks are required for the transportation of construction vehicles, equipment and materials (except turbine components).

Approximately 10,000 truckloads of bulk materials (aggregate mainly) will be required during construction of the Project for turbine foundations, road construction, etc. The majority of the truck loads will be during the early stages of construction, after which truck traffic will be reduced. In an effort to reduce truck loads (and barge trips), other transportation strategies are being investigated, including carrying bulk material loose on the barge and offloading it onto dump trucks after arrival on the island.

Depending on the weight and axle load, some vehicles and materials will be loaded onto the civil barge, while others will use the large component barge. The trip across the North Channel is slightly more than 2 nautical miles. It is estimated that the civil barge can make the trip in approximately 30 minutes one way. This includes a time allowance for loading and unloading, barge travel, mooring and extending of the ramps. The large component barge will take slightly longer.

A special purpose barge will be used for transport and install of the submarine cable.

Table 2.2 provides an overview of the construction vehicles and equipment for the Project and associated barge trips.

A combination of turbine access roads and island public roads will be used to transport equipment and materials to the different turbine sites, substation, operations and maintenance building etc.

Table 2.2: Approximate number of Barge Trips for Construction Materials and Equipment Excluding Turbine Components

Task	Description	Estimated Number of vehicles/loads	Estimated Number of Material/ Civil/ component barge round trips
Mobilization and Site Offices	Offices and Storage set up	50	10
Large Equipment Deliveries	80 ton cranes (mobile crane)	10	15
	300 ton cranes (mobile crane)	30	
	1600 ton cranes (heavy life crawler crane)	100	
	Track-type tractor	4	20
	Tractor-scrapers	2	
	Motor graders	2	
	Compactors	4	
	Telescopic Handlers	4	
	Cement trucks	6	
	Excavators	4	
	Loaders	4	
	Graders	2	
Aggregate for Foundations, Access Roads and Crane Pads	Granular A & B Sand & Clear stone	10,000	1.000-
Steel Reinforcement for Foundation	Rebar on flatbed tractor trailer	65	10
Cable reels		125	15
	Submarine Cable	-	Special purpose barge used for transport and install-
General deliveries not elsewhere listed	Assume 2 deliveries per week for the duration of construction	-	100
			Civil/ Material Barge
Estimated total number of barge round trips including 25% contingency			**1,600**

2.1.3 Delivery of Workers

It is anticipated that approximately 100 construction personnel will work on the Project during peak construction time(s). Personnel will travel to the island using the civil barge. A maximum of 48 passenger vehicles will be transported to the island each day. A maximum of two round trips of the civil barge are required in the morning and evening to transport personnel and their vehicles to and from the island. Stopping alongside Jim Snow Drive will only be allowed for vehicles waiting to board the civil barge.

For the construction of the dock located on the island there are currently, two possibilities for this dock construction process that are being investigated:

1. Construction from the water using a jack-up barge or

2. Construction from the Island.

If the dock is constructed from the water, materials and equipment required for the construction will be transported across the North Channel directly to the property, with the exception of final transition from shore to water which may need to be transported by the Amherst Island ferry (depending on lake water levels at time of construction). Construction vehicle traffic on public roads would be minimal, as the majority of construction activities would occur on private property. This is the preferred option, but technical feasibility needs to be confirmed.

If dock construction from the water is technically impractical, the dock will be constructed from the Island. In this case, construction materials and equipment will be transported to Amherst Island primarily on a private barge using the Ministry of Transportation (MTO) ferry terminal on the Island. Use of the MTO ferry for transportation of workers and materials is also possible and these options will be discussed in detail with the MTO and the Township.

2.2 MATERIAL AND LABOUR REQUIREMENTS

The estimated materials brought on site for the construction and installation of the various Project components (e.g. access roads, foundations) are detailed below. Additional materials brought on site include Project infrastructure described above such as wind turbines. It is anticipated that the following estimated quantities of materials will be required for the construction of the Project (non-compacted volume).

- Granular A – 35,000 m^3
- Granular B – 95,000 m^3
- Sand for collector –15,000 m^3
- Insolated clear stone (20mm) – 4,000 m^3
- Clear stone for public road improvement – 500 m^3
- Course concrete aggregate – 12,000m^3
- Fine concrete aggregate – 6,000 m^3

Hazardous materials to be used during the course of construction are related to fuels, lubricants and fluids that are required for use in construction equipment. These materials will be stored in appropriate storage units during the construction phase of the Project by the construction contractor. Designated storage unit areas and the type of storage units will be confirmed by the construction contractor prior to construction.

Fueling of construction vehicles will take place within designated fueling areas (complying with all applicable regulations) for example such as the operation and maintenance building location, the project laydown (central construction) area and individual work areas. The method of fuel storage (during construction) would be with the use of above ground storage tank(s) ("AST's) (complying with provincial regulations - i.e. double walled with spill containment). It is anticipated that three (3) AST's will be used, each holding a volume of approximately 1000 litres. The fuel would be diesel and regular petrol for use by the construction equipment. An AST would not be used during operation of the project. It should be noted that licensed mobile fuel delivery vehicles will be utilized to service equipment not located at the locations referenced above. This methodology is consistent with best practices (for fuelling vehicles) used in the Ontario construction industry and other jurisdictions.

The AST's would be at,a minimum,steel double walled for leak protection. The tank(s) will also be placed in a 20 mil blended linear polyethylene lined secondary containment basin which can hold a volume of 125% of the volume of the largest tank. The positioning of the AST's will be away from traffic areas with barriers protecting the tanks. If a spill does occur all reporting and containment requirements will be followed as per Section 2.6 of this report. With the containment system proposed any fuel leakage would be contained and the appropriate regulatory authorized contractor will be hired to remove the liquid and recycled at a government approved facility.

2.3 TIMING AND CONSTRUCTION PLANS

A description of the key construction activities are provided below in Table 2.3. Construction activities leading up to Project operations are anticipated to take approximately 18 -24 months.

Table 2.3: Construction Activities – Projection and Approximate Schedule

Phase Details	Approximate Schedule
Surveying	3-7 weeks
Delivery of construction materials, storage materials, site preparation, construction of access roads, staging areas and docks.	5-9 months
Installation of tower foundations	4-5 months
Tower/turbine delivery and erection	4-5 months
Installation of submarine cable	2-4 weeks
Installation of collector lines and transmission line	6-9 months
Installation of substation	4-7 months
Installation of operations and maintenance building	1-3 months
Installation of switching station	2-5 months

Table 2.3: Construction Activities – Projection and Approximate Schedule

Phase Details	Approximate Schedule
Installation of temporary batch plant	1-2 months
Installation of temporary site office	1-2 months
Reclamation of temporary work areas, final grading, topsoil replacement	4-7 months
Project Testing/ Commission	3-6 months
Commercial Operation	1 week

Note: In the event changes are required to the proposed construction schedule, updated construction schedules will be provided to the public through postings on the Project website (www.amherstislandwindproject.com).

2.4 TEMPORARY USES OF LAND

As described above, the lands to be temporarily used during construction may include turbine, access road, met tower, collector line and transmission line staging areas, crane paths, a temporary dock, site office(s), batch plant (the batch plant (will require an Environmental Compliance Approval and if required a Permit to Take Water from the Ministry of Environment), central staging areas, and associated watercourse crossings. The electrical power line collector system would transport the electricity generated from each turbine to the substation, along the submarine cable to the mainland and then to a switching station located near to an existing HONI 115 kV transmission line. The requirements for these temporary areas including upgrades and restoration are described above.

2.5 WASTE DISPOSAL

Waste materials brought to the site that will require removal include equipment packaging, scraps, fuels and other lubricants and will require reuse, recycling, and/or disposal at an appropriate MOE-approved off-site facility.

Waste that is generated at or transported from the Project Location is described below. Sanitary waste generated during the construction phase will be collected via portable toilets and wash stations supplied by a licensed third party who will be retained prior to the start of major construction activities. The excavated area for the foundations and other infrastructure will consist of surface and subsurface materials. These materials excluding excavated soil will require removal from the site and disposal at an approved off-site facility. This will require the use of large dump trucks that are capable of transporting heavy loads of excavated material. The exact type of truck and number of truck trips required for the removal of gravel, fill, and excavated material will be determined and confirmed by the construction contractor prior to construction of the Project. The excavated soil removed for installation of infrastructure such as access roads, crane pads, substation, foundations, etc., will be re-used on site as feasible. If not feasible, the soil will be disposed of at an MOE-approved off-site facility to be determined by the construction contractor. Should contaminated soil be encountered during the course of excavations, the contaminated material will be disposed of in accordance with the current appropriate provincial legislation, such as Ontario Regulation 347, the *General – Waste Management Regulation*.

There will be no long-term on-site storage of waste during the construction of the Project and final disposal of waste will be conducted by a third-party contractor at an MOE-approved facility. As requested by Loyalist Township no waste material will be deposited at the Amherst Island waste disposal facility.

During construction and decommissioning, waste material would be generated at, and transported from, the Project Location. Waste material produced by the Project is expected to consist of construction material (e.g. excess fill, soil, brush, scrap lumber and metal, banding, plastic wrap removed from palletized goods, equipment packaging, grease and oil, steel, etc.) and a minor amount of domestic waste (i.e. garbage, recycling and organics).

Disposal of any hazardous materials will be in accordance with regulatory requirements. See Section 2.2 for a description of hazardous materials that may be brought to the site.

2.6 ACCIDENTAL SPILLS

Standard containment facilities and emergency response materials will be maintained on-site as required. Refueling, equipment maintenance, and other potentially contaminating activities will occur in designated areas.

In the event of a potential discharge of fluids associated with Project construction, the construction contractor will immediately stop work and rectify the accidental spill. Once the spill is under control the construction 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*. A detailed Construction Emergency Response and Communications Plan will be prepared by the construction contractor which 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 (1-800-268-6060).

3.0 Potential Environmental Effects and Mitigation Measures

O. Reg. 359/09 requires that any adverse environmental effects that may result from engaging in the proposed Project be described in the REA application. The term "environment" in O. Reg. 359/09 has the same meaning as in the *Environmental Assessment Act*, and includes the natural, physical, cultural, and socio-economic environment.

The following environmental features have been assessed as part of the REA application process:

- Heritage, Protected Properties and Archaeological Resources;
- Natural Heritage Resources;
- Water Bodies and Aquatic Resources;
- Air, Odour, Dust;
- Environmental Noise;
- Land Use and Socio-Economic Resources;
- Provincial and Local Infrastructure; and,
- Public Health and Safety.

Mapping provided in **Appendix A** illustrates the natural environment and socio-economic features and shows the 300 m study area around the Project Location boundary.

For some natural environment and socio-economic features, avoidance during Project siting and mitigation measures are anticipated to eliminate all effects. The application of these principles has greatly reduced the potential for adverse environmental effects from the Project.

The key performance objective for each of the features noted above is avoiding and/or minimizing potential effects (through the use of appropriate mitigation measures) to the features throughout the construction phase of the Project. The proposed mitigation measures would assist in achieving this performance objective.

A summary of potential effects and mitigation strategies with corresponding performance objectives, monitoring plans and contingency measures that have been identified which may result from the construction of the Project is provided in **Appendix B**.

A description of the existing environment can be found within the Draft Natural Heritage Assessment/Environmental Impact Study (NHA/EIS), *Draft Heritage Assessment, Draft Protected Properties Assessment, Draft Stage 1 and Stage 2 Archaeological Assessments*, *Draft Underwater Archaeological Assessment,* and *Draft Water Assessment and Water Body Report*.

The construction contractor will be the primary party responsible for the implementation of construction effects monitoring. Implementation of these measures would be undertaken in compliance with applicable municipal, provincial, and federal standards and guidelines.

4.0 Construction Environmental Management Plan

Although not a requirement of O. Reg. 359/09, Windlectric, in consultation with the construction contractor, will prepare a Construction Environmental Management Plan (CEMP) prior to the initiation of any substantive on-site works (a copy will be provided to the Township for review). The CEMP would be the controlling plan for all construction activities, and would be designed to minimize potential adverse environmental effects, while enhancing the Project's benefits. The CEMP would be based on the environmental effects and mitigation measures identified in this report, and related reports to be submitted as part of the REA application. As part of the construction program, site practices and procedures would be implemented to further reduce the environmental effects identified in this report and supporting studies. These practices may include specifications regarding disposal of excavated material, sediment control, dust control, and soil compaction control. In addition, Windlectric staff and contractors would be made aware of the environmental commitments contained in this report and supporting studies to ensure the commitments are implemented.

The Project CEMP would include procedures and plans based on regulatory requirements and accepted site practices and as appropriate would include the following plans:

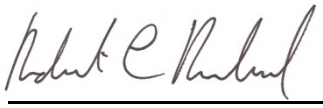
- Traffic Management Plan
- Hazardous and Non-Hazardous Waste Management Plan
- Health and Safety Plan
- Emergency Response and Communications Plan
- Training Plan, and,
- Complaint Response Protocol.

5.0 Closure

The Amherst Island Wind Energy Project *Draft Construction Plan Report* has been prepared by Stantec for Windlectric in accordance with Ontario Regulation 359/09, and in consideration of the *Technical Guide to Renewable Energy Approvals*.

This report has been prepared by Stantec Consulting Ltd. for the sole benefit of Windlectric, and may not be used by any third party without the express written consent of Windlectric and Stantec Consulting Ltd. The data presented in this report are in accordance with Stantec's understanding of the Project as it was presented at the time of the Report.

STANTEC CONSULTING LTD.



Rob Rowland
Senior Project Manager

Kerrie Skillen
Project Manager

\\cd1220-f02\root\work_group\01609\active\60960595\reports\construction plan report\december 2013 - revised version\aiwep_cpr_20131204_fin_post_rea.docx

6.0 References

Ontario Ministry of the Environment, 2011. Technical Guide to Renewable Energy Approvals. Renewable Energy Approvals. Queen's Printer for Ontario.

Ontario Regulation 347. General – Waste Management Regulation Under the Environmental Protection Act.

Ontario Regulation 359/09. Renewable Energy Approvals Under Part V.0.1 of the Act made under the Environmental Protection Act.