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2.1.2 Access Roads

Access roads are required in order to deliver the wind turbine components as well as allow operations and maintenance of the wind turbines. The central and eastern areas of the project will be accessed via Highway 6 and Green Bush Road, while the western area of the project will be accessed via Highway 540. The access roads to be constructed will, in most sections, be approximately 10 meters wide with no ditches and be composed of a gravel base. In sections with steeper terrain, ditches and culverts will be incorporated to avoid washout of the road. Where turning is required, the width of the road will be wider. Figure 2-1 illustrates the locations of the proposed turbine access roads.

Any soils encountered along the proposed roads Right-of-Way (ROW) will be excavated and used as fill material to bring low areas to desired grade. The foundation of the road (roadbed) will be at the depth required to support the anticipated traffic loads associated with the construction and operations of the wind farm.

During construction, concrete trucks, pick-up trucks, cranes on tracks and transport trucks bringing turbine components to the site will use these access roads.

2.1.3 Electrical Connections/Substation

A 34 kV electrical power collection system will be installed to connect the turbines to the Transformer (or Sub) Station. Generally, each wind turbine will be interconnected with a largely overhead line that would first follow the turbine access roads and then run along the municipal road right-of-way. Figure 2-1 shows the electrical connection lines as proposed.

The substation (which serves to convert the generated electricity from 34 kV to 115 kV so that the wind farm can be tied into the Hydro One Transmission line) will be located within the study area, as shown in Figure 2-1. A switching station would be required next to the point of connection with the Hydro One transmission line. About 0.4 ha of land would be required for this switching station.

The substation has been included in the noise analysis of the wind farm. As final substation specifications are not known at this time, maximum noise emission specifications were used, corresponding to the worst case scenario. Required noise mitigation for the substation has been proposed.

Transmission Line

The proposed new 115 kV transmission line to connect the wind farm to the Hydro One Transmission line system is approximately 10 km in length. The right-of-way (ROW) width will depend on the structure type. It is anticipated that the maximum width of the ROW would be approximately 8-10 meters depending on the distance of poles and conductor swing. The transmission line route as shown in Figure 2-1 is largely contained within municipal road

rights of way. Some private land will be crossed and easements through the affected parcels of private land have been acquired by NPI. Some adjustments to the routing may be made subject to public input, engineering and detailed vegetation survey work.

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Ontario Energy Board (OEB) approvals will be required for the proposed 115kV transmission line. These approvals are: Leave to Construct the line (Section 92), Right of Entry (Section 98) for gathering survey and engineering data) and Authority to Expropriate (Section 99).

2.1.4 Staging/Laydown Areas

Turbine staging areas are located at each turbine site. The turbine staging area is comprised of three different zones. The crane pad is the area needed to support the crane used for construction and will be approximately 12 meters wide by 36.5 meters deep and will be accessible from the access road with a slope of less than 1% or less in all directions. Each turbine position will also require a staging and equipment storage area for the safe erection of the towers and the lift and securing of the nacelle and blades. Thus, a total leveled surface of approximately 40m by 40m will be required at each turbine. Furthermore, a 360 degree radius around the base of the turbine

to a distance of 50 meters at a 5% grade is needed for the assembly and erection of the turbines.

General guidelines for a wind turbine staging area are described below. Note these dimensions are indicative and may be modified once detailed engineering design is performed.

Construction Site at Each Tower Foundation

- At each wind turbine location, a lay-down area will be provided adjacent to the access road of sufficient area to permit any Turbine Equipment being delivered to the Crane Pad to be offloaded and stored pending erecting and installation of the same. Vegetation from this area will be cut short and a graded working area will be provided with a 150' radius from center of Turbine Foundation with berms removed.
- Any portion of the lay-down area, or other travel path between the access roads and the laydown area, over which delivery trucks are expected to travel in order to deliver the relevant Turbine Equipment shall satisfy the requirements set for Site Access Roads.
- The maximum construction site required at each foundation is 225 feet (69 m) by 250 feet (76 m) (the "Construction Site"); the Construction Site includes a crane pad area of 80 feet (24 m) by 60 feet (18m), which may have a maximum slope of 1% in any direction.
- The crane pad, the Construction Site and the access road parallel to the Construction Site will generally all be at the same grade.
- The remainder of the Construction Site will be cleared of vegetation, rocks and other obstructions that may impede access by erection equipment.
- Soil compaction to provide ground-bearing capacity of nominal 4,500 pounds per square foot.
- Shoulder slopes, if required, for crane pad will be no greater than 45°. Pad area will be

graded to drain all water away from crane pad.

Lay Down, Storage and Staging Area

- An open area of not less than 300 feet (92 m) by 600 feet (183 m) will be required as a staging area.

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- The periphery of the staging area will be cleared of trees, and topsoil, gravel, and revetment berms and other like excavations removed, to ensure that there are no overhanging obstructions that could prevent unhindered access and operation of construction vehicles including cranes.
- All overhead obstructions will be removed prior to start of Turbine Equipment deliveries.
- The laydown area will have a single entrance and a single exit, which will be at opposite ends of the laydown area so as to allow one-way drive-through access to trucks and trailers servicing the laydown area. The entrance and exit will be 40 feet (12 m) wide and have an inside turning radius of at least 150 feet (46 m).
- Roads leading to entrances / from exits will be in accordance with access roads described above.

The land for the staging area will be disturbed with some tree removal, grubbing and compaction during the construction period. The crane pad will remain on site for the duration of operations for maintenance.

2.2 Description of Project Activities

The key project activity phases include: construction, operations and decommissioning of the wind farm and transmission line. Table 2-2 provides a description of the key activities that will occur under each project phase. A key aspect of all project phases will be on the minimization of environmental and social effects. The wind turbines have been sited to maximize distances from sensitive natural features. Access roads and electrical connection lines have been routed to minimize their length and avoid sensitive natural features.

2.2.1 Construction Phase

The construction phase of any major project such as this has the potential for adverse effects on the environment. Key activities during the construction phase include: clearing, topsoil stripping, grading, access road development, trenching of underground distribution lines, watercourse crossing construction, foundation excavation, transportation, assembling and erecting of the turbines and distribution poles. Key activities during the construction of the transmission line include: surveying, clearing, and installation of the poles and stringing of the conductors. An Environmental Management Plan will be developed and its implementation monitored by a NPI environmental inspector.

2.2.2 Operation and Maintenance Phase

Once the project is operational, the wind turbines and transmission line will operate

automatically. There is little maintenance required for the turbines and transmission line, aside from periodic routine servicing. Any wastes generated, including fluids and oils, will be recycled where possible and if not possible, will be disposed of at an approved facility. The turbines will be accessed primarily by all-terrain vehicles or light trucks. Larger trucks or cranes may be

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