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Cultural Heritage – Bornish Wind Energy Centre

- A Cultural Landscape and Built Heritage Self Assessment was completed in accordance with Ontario Regulation 359/09 under the Environmental Protection Act (2009).

- Consultation with the Ontario Heritage Trust, the municipality and a property inspection was conducted to ensure that there were no protected properties or properties with potential heritage significance or interest within and adjacent to lands proposed to have project infrastructure.

- Following the assessment, it was determined that no protected properties or cultural heritage landscapes with heritage value or interest are situated within or beside the Project Location.

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Water – Bornish Wind Energy Centre

- A Water Assessment and Water Body Report was completed in accordance with O.Reg 359/09 to identify and address any water bodies within 120m of the Project Location. A water body includes a lake, permanent stream, intermittent stream and seepage area.

- 17 water bodies were identified within the Project Area and 21 sites within these features were identified within 120 m of the Project Location

- No lakes, Lake Trout lakes, or seepage areas were identified within 120 m of the Bornish Wind Energy Centre project location.

- The report concluded that the Project can be constructed and operated without any remaining effects that could harm the environment.

Potential Effects and Mitigation

The table below presents a summary of the potential effects on water bodies and proposed mitigation measures:

Project Phase	Potential Effect	Mitigation Measures
Construction and Decommissioning	Erosion and sedimentation	Schedule clearing, grubbing and grading activities to avoid times of very high runoff volumes, wherever possible. Stabilize banks as soon as possible after construction disturbance (i.e. plantings, rock etc.), if insufficient time is available in the growing season to establish vegetative cover, an overwintering treatment such as erosion control blankets, fiber matting etc. should be applied to contain the site over the winter period. Minimize disturbance by keeping construction equipment outside and away from water bodies wherever possible. Work in dry conditions (i.e. low flow period) or isolate in-water work area using good engineering practices and dewatering techniques. Install silt fencing in-water downstream of dewatering activities. Dewatering discharge should be dissipated (i.e. sand bags, hay bales etc.)
	Temporary disruption of fish habitat (in-water work)	Restrict construction during sensitive timing windows, as indicated by local OMNR. Work in the dry (i.e. low flow) or isolate work area using good engineering practices or by working in dry conditions using accepted methods to bypass flows. Machinery should be operated in a manner That minimizes disturbance to the banks and bed of the watercourse. Stabilize banks as soon as possible after construction disturbance (i.e. plantings, rock etc).
	Soil Compaction	Controlled vehicle access routes. Staging areas should be located away from water bodies (i.e. 30 m). Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.
Operations		Implement Spill Response Plan Implement road salt, sand management Plan. Avoid or limit use of pesticides, where possible. Address any impacts resulting from design or construction phases

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Natural Heritage - Bornish Wind Energy Centre

- Information was gathered to identify and investigate natural features such as provincial parks, wetlands, woodlands or wildlife (e.g. bird or bat) habitats within 120m of the Project Location. Features were evaluated for significance, according to provincial criteria. Where significance was established an Environmental Impact Study (EIS) was conducted.

- The EIS identified potential negative effects on the environment, proposed mitigation measures, identified residual effects and their significance, and described how the environmental effects monitoring plan, and construction plan address any potential negative environmental effects.

- The following features were identified as significant:
  - 10 wetlands;
  - 30 woodlands;
  - 2 valleylands;
  - 11 types of significant wildlife habitat (e.g. amphibian breeding habitats, rare forest types, bat maternity colonies, waterfowl nesting habitat, woodland raptor nesting habitat.); and
  - 13 generalized significant wildlife habitats

- For each natural heritage feature identified as significant, potential effects were assessed and mitigation measures/monitoring commitments proposed depending on the type of project infrastructure affecting the feature.

- The EIS was approved by the MNR

The table below presents a summary of the potential effects and mitigation.

Project Phase	Potential Effect	Mitigation Measures
Construction and Decommissioning	Direct vegetation removal	Clearly delineate work area within 30 m of significant natural features or wildlife habitats using erosion fencing, or similar barrier, to avoid accidental damage to species to be retained. Any tree limbs or roots that are accidentally damaged by construction activities within significant woodlands or valleylands will be pruned using proper arboricultural techniques. No vegetation removal will occur in rare plant communities, sensitive landforms or significant wetlands. Periodic monitoring will take place during construction/decommissioning to ensure compliance
	Sedimentation and erosion	Implement a sediment and erosion control plan within 30 m of a significant natural feature or wildlife habitat. Install, monitor, and maintain erosion and sediment control measures (i.e. silt fences) around the construction areas within 30 m of a significant natural feature or wildlife habitat. Periodic monitoring will take place during construction/decommissioning to ensure compliance
	Spills (i.e. oil, gasoline, grease, etc.)	All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30 m from any significant natural feature or wildlife habitat. Develop a spill response plan and train staff on appropriate procedures. Keep emergency spill kits on site. Dispose of waste material by authorized and approved offsite vendors. Any stockpiled material will be stored more than 30m of a wetland, woodland, or water body.
Operations	Disturbance and/or mortality to local wildlife (i.e. birds and bats)	Avoid placing turbines within blade length of significant habitat. Propose obstruction lighting scheme that minimizes risk to bird and bat collisions while fulfills Transport Canada requirements. Conduct post construction mortality monitoring according to the document *Bat and Bat Habitats: Guidelines for Wind Power Projects* and *Bird and Bird Habitats: Guidelines for Wind Power Projects*.

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Natural Heritage: Birds

- NextEra Energy Canada has utilized an avian (bird) monitoring protocol that meets the requirements of the MNR natural heritage assessment guidelines for turbines and birds

- Bird surveys for the Bornish Wind Energy Centre have included Breeding Bird Surveys and Winter Bird Surveys, which were completed in 2007 and 2011

- Bird surveys were conducted over two seasons to profile species and look at the following factors:

  - Migration Patterns
  - Breeding Activity
  - Behaviour Patterns
  - Significant or Critical Habitats

- The breeding bird surveys were conducted by establishing point count locations and conducting habitat searches in the study area, while recording visual and sound observations

- The last of the bird studies was completed in June 2011 and data from the studies is currently being analyzed and compiled

- The findings of these studies have been reviewed and approved by the MNR

- Findings from the natural heritage studies are being considered in the wind farm design to minimize impact as much as possible

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Natural Heritage: Bats – Bornish Project

- NextEra Energy Canada has implemented a bat monitoring program that is consistent with MNR expectations for proposed wind energy generating facilities

- Properties that contained wooded areas within 120 m (394 feet) of proposed infrastructure were examined by biologists to search for suitable bat habitat

- After identifying suitable bat habitats, certain features were chosen for more extensive monitoring which involved installing bat monitoring equipment within (or adjacent to) the wooded habitats for 10 days in June/July to record the number of bat passes

- These properties also required 10 nights of visual surveys that involved examining woodlands with spotlights and microphones to assess bat activity and species composition

- Bat monitoring was completed in accordance with the Ontario Ministry of Natural Resources "Bats and Bat Habitats: Draft Guidelines for Wind Power Projects (March 2010)" and has been reviewed and approved by the MNR as part of the REA's Natural Heritage Assessment requirements

- In July 2011, after the completion of the 2011 monitoring program, the Ontario Ministry of Natural Resources has issued new guidelines "Bats and Bat Habitats : Guidelines for Wind Power Projects" with more specific criteria for evaluation bat habitat. Re-assessments of all woodlands within 120m of proposed infrastructure were completed according to the newly updated provincial regulations

- Findings from these studies are being considered in the wind farm design to minimize impacts as much as possible

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Noise Study

Noise studies were conducted to help determine the final turbine layout. The noise studies comprise the following steps:

- **Step 1:** Identify points of reception – dwellings (typically houses) that are within 2km of the wind turbines

  The MOE Noise Guideilnes generally define a Point of Reception (POR) as a house, campground, church, school or other sensitive building that is not located on the same premises as the wind farm, including its turbines and ancillary structures. POR's can also include locations on vacant lots that have residences as a permitted use; in this case a Vacant Lot Receptor (VLR) is required.

- **Step 2:** Obtain wind turbine specifications and noise emission ratings from the manufacturer

- **Step 3:** Using an initial wind turbine layout, predict the noise levels generated at points of reception using a noise prediction model to ensure allowable limits are not exceeded. The noise model is designed in accordance with standards set by the Ministry of the Environment (MOE)

- **Step 4:** Using the noise model results, revise the turbine layout as necessary to ensure that the final turbine layout meets all applicable noise guidelines

Noise requirements under Renewable Energy Approval Regulation (O.Reg. 359/09)

- Wind turbines will be set back from dwelling units that are not part of the project by at least 550m (1804ft) and must be at or below 40dBA.

- Noise from turbines must meet provincial noise limits as outlined in MOE publication 4709e "Noise Guidelines for Wind Farms"

Noise Assessment results

- Modelling of predicted noise levels from the proposed turbines, transformer station and proposed/existing wind farms within 5 km of the Project Location was undertaken. The results were as follows:

  - All non-participating residences (vacant or occupied) comply with MOE guidelines for wind turbines – they are below the 40 dBA noise threshold and are greater than 550m from the nearest wind turbine;

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Shadow Flicker - Bornish Wind Energy Centre

Shadow flicker may occur under certain combinations of circumstances with regards to the sun's position and wind direction; when the sun passes behind the rotating blades of a wind turbine, a moving shadow is cast in front of or behind the turbine. When viewed from a stationary position, the moving shadows cause periodic flickering of the sunlight, otherwise known as "shadow flicker".

The effect is most noticeable inside buildings, where the flicker appears through a window opening. The likelihood and duration of the effect depends on a number of variables, namely:

- Orientation of the building relative to the turbine;
- Wind direction: the shape and intensity of the shadow are determined by the position of the sun relative to the blades (the turbine rotor continuously yaws to face the wind so the rotor plane will always be perpendicular to the wind direction;
- Distance from turbine: the farther the observer from the turbine, the less pronounced the effect;
- Turbine height and rotor diameter: a larger turbine rotor diameter will cast a larger shadow, meaning a larger area will be prone to incidences of shadow flicker;
- Time of year and day: position of sun relative to the horizon;
- Weather conditions: cloud cover reduces the occurrence of shadow flicker;
- Vegetation and other obstacles that help to mask shadows; and
- Whether or not the turbines are operating

Shadow Flicker Assessment and Results

- To assess the effect of shadow flicker, receptor location, hourly meteorological data, topography of the wind farm site, and turbine specifications such as rotor diameter and hub height were considered.

- The worst case maximum shadow flicker per day was calculated to be 40 min/day and 27 hr/year.

- This is a conservative analysis as it does not account for

    - Operational downtime due to low winds, high winds or maintenance
    - The amount of time the turbine is not directly facing the sun which will reduce the area of the projected shadow thus the shadow flicker incidence
    - The presence of vegetation and other physical barriers
    - The amount of aerosols (moisture, dust, smoke, etc.) in the atmosphere

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Decommissioning

- The anticipated life of the project is approximately 30 years. Decommissioning of the turbines will occur following the operations phase. A plan has been developed to dismantle or decommission the Project and to restore the land and manage excess water or waste.

- Decommissioning will be done in accordance with the Ontario Health and Safety Act and any applicable municipal, provincial and federal regulations and standards.

- The following components will be removed during dismantling:

    1. **Turbines;**
    2. **Overhead lines and poles; and**
    3. **Transformer substations.**

Restoration of land and water

- All areas, including the access roads, transformer pads and crane pads will be restored as much as practical to their original condition with native soils and seeding in consultation with the landowner.

- There is the option for turbines to be “re-powered”, meaning that components could be replaced to extend the life of the Project and delay decommissioning. This is optional, and turbines may still be decommissioned.

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Transmission Line

Transmission line - Why is it needed?

- Deliver clean energy to the Ontario system operator to reduce the use of fossil fuel generated electricity by Ontarians.
- System studies indicate there is ample capacity at this point of interconnection without significant network upgrades.
- Investment in transmission infrastructure is needed in Ontario. The plan places no additional burden on our aging infrastructure or Ontario ratepayers.

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Transmission Route Overview

- NextEra Energy Canada will build a 115 kV electrical transmission line from the step-up transformer station to the connection point with the Provincial electricity grid.

- The transmission line will be located on private property or within existing road rights-of-way.

- The electricity collected via the 34.5 kV underground collection lines will converge at the transformer substation where the electricity will be “stepped-up” to 115 kV for transmission and then routed to a switchyard.

- The switchyard will occupy 2-3 hectares and is common to three of NextEra’s Wind Energy Centres (i.e. Bornish, Adelaide, and Jericho).

- The switchyard will collect power from the three Wind Energy Centres and will deliver the electricity to a second substation where the electricity will be “stepped up” to 500 kV at the point of interconnect with the existing Hydro One transmission line.

Selecting a Transmission Route

- Distance between the transmission line and existing structures is considered when selecting a route.

- Easement widths located on private property will vary between 33 - 200 feet (10 - 60 metres). Widths vary due to special features on a particular parcel.

- Existing land uses and the location of environmentally sensitive features are considered when choosing a route.

Land Owners and Easement Agreements

- NextEra Energy Canada is committed to working with landowners within the transmission corridor to find a mutually acceptable route for the transmission line.

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Construction of a Transmission System

The construction of the transmission system is being considered on municipal rights of way, private lands or a combination of both within the transmission study area.

- Transmission structures will typically be single poles made of metal, wood, or concrete.
- Poles will be approximately 18 – 27 metres (60 - 90 feet) in height. The transmission line will be mounted on existing or new hydro poles.
- A typical span between poles will be 91 – 182 metres (300 - 600 feet).
- Wherever practical, transmission and distribution will be co-located on a single pole.
- Transmission lines must be constructed to standards outlined by the Province and/or electrical codes.

Transmission Approvals Process

- Transmission lines (lines with voltages higher than 50 kV) that are longer than 2km require a Leave to Construct from the Ontario Energy Board.
- This process examines the need for the line and the proposed routing to ensure that the priorities given to the Ontario Energy Board by the government are met.
- The line is also permitted as part of the Renewable Energy Approval (REA) process.
- Natural heritage and archaeological studies are being conducted along proposed routes within the transmission study area including:
  - Vegetation studies
  - Aquatic habitat assessments; and
  - Birds, bat and wildlife studies
- Any additional studies that may be required as a result of route selection will be conducted prior to construction.

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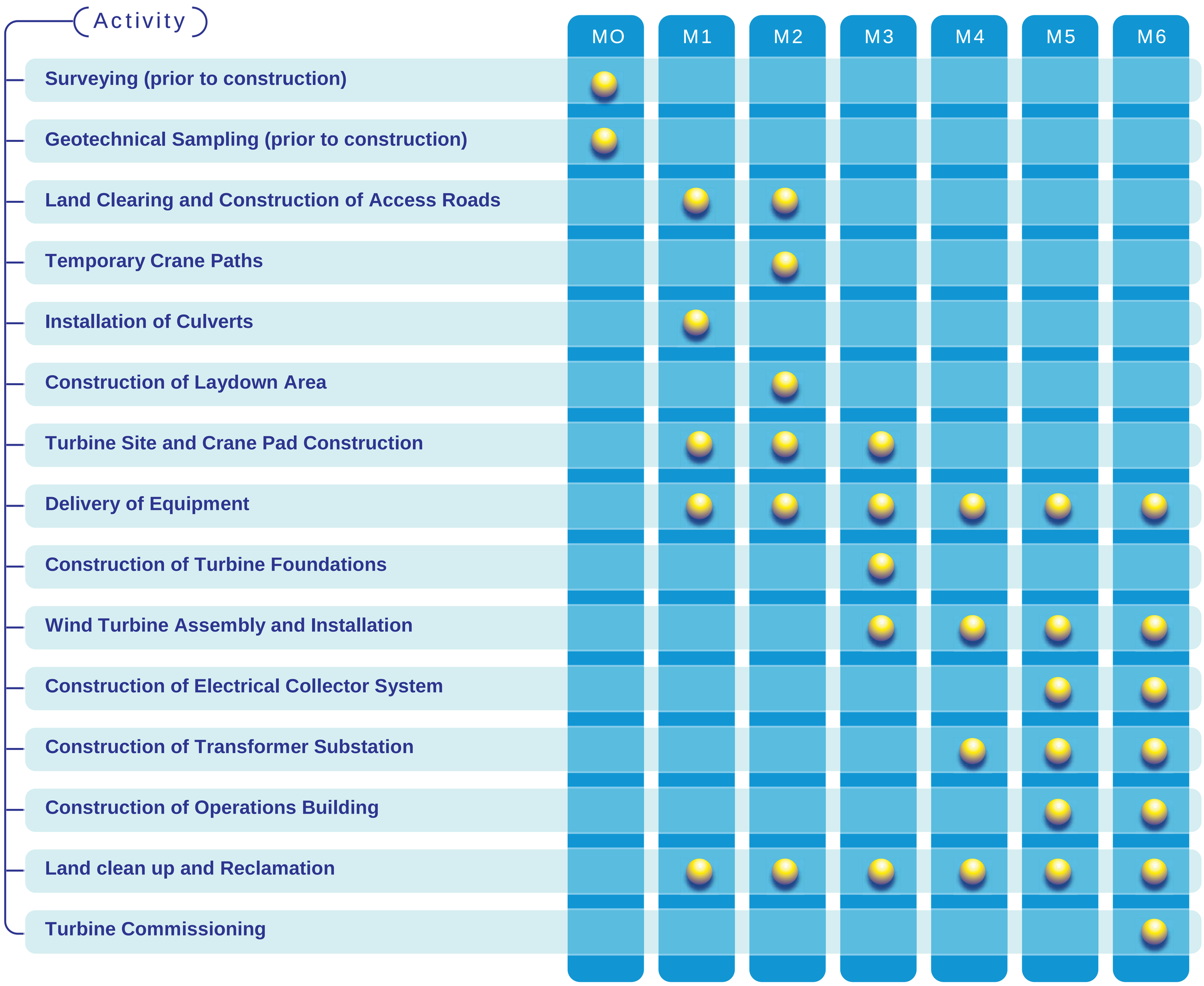
Construction Plan

- A construction plan has been developed to detail all the activities that are part of the Project's construction phase. This plan includes details of any potential effects, the appropriate mitigation measures and ongoing monitoring commitments.

- The schedule below shows the anticipated construction schedule for the Project. Construction is expected to start in late summer/early fall 2013 and last for 6 months.



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Next Steps

REA Process

- The final REA reports will be submitted following the public open houses which will initiate the Ministry of the Environment's review.

- Final reports will be available online at www.NextEraEnergyCanada.com

- Comments received on or before July 17, 2012 will be included in our Public Consultation report to the Ministry of the Environment. Should you wish to provide comments after this date, they can be forwarded directly to the Ministry of the Environment

Other Approvals Required Before Construction

- In addition to the REA, permits and certificates of approval may be required from approval agencies before construction can begin. These may include:

  - Archaeological Clearance from the Ontario Ministry of Tourism, Culture and Sport (MTCS);
  - Fisheries Act Authorizations from the Federal Department of Fisheries and Oceans (DFO);
  - Aeronautical Obstruction Clearance from Transport Canada;
  - Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Permit from the Ausable Bayfield Conservation Authority (ABCA); and
  - Other permits or authorizations from the Ontario Ministry of Natural Resources (MNR) and North Middlesex and Middlesex County.

Please visit www.NextEraEnergyCanada.com
for more details on the progress of the project

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Thank you for Attending!

- Thank you for attending this evening's Event
- Your input is important to us: please fill out an exit questionnaire and either leave it with us tonight or mail it to us using the contact information below
- Should you have any further questions or comments, please do not hesitate to contact us:

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