



NAPIER WIND PROJECT
NATURAL HERITAGE
ASSESSMENT AND
ENVIRONMENTAL IMPACT STUDY

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Executive Summary

wpd Canada Corporation (wpd) is a renewable energy development company based in Mississauga, Ontario, dedicated to providing renewable energy for Ontario. wpd is proposing to develop the Napier Wind Project (the Project) in the Township of Adelaide Metcalfe, County of Middlesex, Ontario. The basic components of the Project include two REpower MM92-2.05 MW wind turbine generators, step-up transformers located adjacent to the base of each turbine, a 27.6 kV underground electrical power line system, a switching station, and turbine access roads. wpd has retained Stantec Consulting Ltd. (Stantec) to prepare a Renewable Energy Approval (REA) Application, as required under Ontario Regulation 359/09 - Renewable Energy Approvals for a Class 4 Wind Facility. The Napier Project Location is sited within actively farmed agricultural fields and has been sited more than 120 m from the majority of natural features in the Project Study Area.

Pursuant to O. Reg. 359/09, a Natural Heritage Assessment (NHA) is required for all renewable energy projects, including a records review (s. 25), site investigation (s. 26) and evaluation of significance (s. 27) for any natural features in, or within 120 m of, the Project Location. The results of the NHA must be consolidated into a report and submitted to MNR for confirmation (s. 28) in advance of submission of the REA application to the MOE. The results of the NHA are intended to identify any significant natural features located within 120 m of the Project Location, for which the completion of an Environmental Impact Study (EIS) is required in accordance with section 38 of O. Reg. 359/09. This report satisfies the noted requirements for an NHA and EIS.

The records review identified two wooded areas as the only known natural heritage features occurring within 120m of the Napier Project Location. Site investigations were then completed with the purpose of confirming the status and boundaries of natural features identified through the records review and identifying any additional features. The field investigations concluded that no natural habitat is located in the Project Location. Wooded areas were confirmed during the records review and classified as cultural woodland (feature 1) and deciduous swamp and wetland (feature 2). A third feature was identified during site investigations and conservatively classified as cultural woodland (feature 3).

Based on an assessment of background information and the results of on-site field investigations, feature 2 was identified as a significant woodland and significant wetland feature. An EIS was completed under O. Reg. 359/09 s.38, to identify and assess any negative environmental effects to the significant feature, and including any required mitigation.

The EIS identified the feeder line as the only project component occurring with 120m of significant natural features (feature 2; woodland and wetland). The feeder line is located entirely within existing municipal road right-of-way. At the closest point, the proposed feeder

line is located 37 m from feature 2. Potential impacts (including construction and operation phase impacts) to the feature were considered limited and no mitigation requirements were identified. The report also commits to a post-construction monitoring study as required by REA regulation.

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1.0 Introduction

1.1 PROJECT OVERVIEW

wpd Canada Corporation (wpd) is a renewable energy development company based in Mississauga, Ontario, dedicated to providing renewable energy for Ontario. wpd is proposing to develop the Napier Wind Project (the Project) in the Township of Adelaide Metcalfe, County of Middlesex, Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province. The Project was awarded a Feed-In-Tariff (FIT) contract with the Ontario Power Authority (OPA) in July, 2011 (F-002194-WIN-130-601).

The basic components of the Project include two REpower MM92-2.05 MW wind turbine generators, step-up transformers located adjacent to the base of each turbine, a 27.6 kV electrical power line system, a switching station, and turbine access roads. Temporary components during construction include work and storage areas at the turbine locations and along access roads and laydown areas. The collector system will transport the electricity generated from each turbine to a switching station located on private property at Napperton Road where it will flow through a feeder line to tie into the Hydro One Networks Inc. distribution network. The connection point for the feeder line is at the Corner of Katesville Dr. & Kerwood Rd.

wpd 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, the Project is classified as a Class 4 Wind Facility and will follow the requirements identified in O. Reg. 359/09 for such a facility.

1.2 PROJECT LOCATION AND PROJECT BOUNDRY

The "Study Area" used for the records review component of this NHA report generally includes all lands within 1km of the Project Location in order to identify natural features that may occur within, or partially within, 120 m of the Project (Figure 1, Appendix A).

The proposed "Project Location", as defined in O. Reg. 359/09, includes any air space and all parts of the land in, on or over which the Project is proposed. As required by the regulation, a 120 m "Zone of Investigation" has been identified around the outer limits of the Project Location; measured as 120 m from the outer limit of the Project Location, where site preparation and construction activities will occur and where infrastructure will be located (MNR, 2011a). The outer limit includes the turbine blade tip where that component forms the outer limit of the Project Location. The Project Location and 120 m Zone of Investigation are shown on Figure 2, **Appendix A**.

2.0 Renewable Energy Approval Requirements

2.1 RENEWABLE ENERGY APPROVALS

Ontario Regulation 359/09 (as amended by O. Reg. 376/09 and O. Reg. 521/10) issued under the *Environmental Protection Act* outlines the application, approval, consultation and reporting requirements necessary to obtain approval of a renewable energy project, such as a wind, solar, thermal treatment or anaerobic digestion facility.

This NHA and EIS report is intended to satisfy sections 24 through 28, 37 and 38 of O. Reg. 359/09. It has been prepared through consultation with the MNR with guidance provided from *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a) for submission as a component of the REA application for this Project.

Pursuant to O. Reg. 359/09, an NHA is required for all renewable energy projects, which must include a records review (s. 25), site investigation (s. 26) and evaluation of significance (s. 27) for any natural features in, or within 120 m of, the Project Location. The results of the NHA must be consolidated into a report and submitted to MNR for confirmation (s. 28) in advance of submission of the REA application to the MOE.

The location, boundaries, characteristics and significance of the following natural features and areas must be determined in relation to the Project Location:

- life science and earth science areas of natural and scientific interest (ANSIs);
- wetlands, including coastal, northern and southern wetlands;
- valleylands;
- wildlife habitat;
- woodlands; or
- Provincial parks and conservation reserves.

Any sand barrens, savannahs, tallgrass prairies or alvars must also be considered where a Project occurs within the Protected Countryside identified under the *Greenbelt Act* or within the Oak Ridges Moraine Conservation Plan Area identified under the *Oak Ridges Moraine Conservation Act*. However, this Project is not located within the Greenbelt or Oak Ridges Moraine and therefore consideration for these natural features is not required under O. Reg. 359/09.

The results of the NHA are intended to identify any significant natural features located within 120 m of the Project Location, for which the completion of an EIS is required in accordance with section 38 of O. Reg. 359/09. An EIS must be completed in accordance with MNR procedures and must identify and assess any negative environmental effects of the Project, identify appropriate mitigation measures and describe how the environmental effects monitoring plan and construction plan will address any negative environmental effects (O. Reg. 359/09, s. 38(2)(a)).

Prohibitions for the construction, installation or expansion of a renewable energy generation facility exist for provincially significant southern wetlands, provincially significant coastal wetlands, or a provincial park or conservation reserve (unless otherwise permitted under the Provincial Parks and Conservation Reserves Act, 2006) (O. Reg. 359/08, s. 37). Renewable energy generation facilities may be permitted within the following areas subject to the completion of an EIS:

- provincially significant northern wetland;
- provincially significant life science area of natural and scientific interest (ANSI);
- significant valleyland;
- significant woodland;
- significant wildlife habitat;
- within 120 m of the above natural features, provincially significant southern wetland, provincially significant coastal wetland, provincial park or conservation reserve;
- provincially significant earth science ANSI; or
- within 50 m of a provincially significant earth science ANSI (O. Reg. 359/09, s. (38(1))).

The NHA and EIS report is submitted to the MNR for review prior to the submission of a REA application to the MOE. Written confirmation from the MNR (s. 38(2)(b)), as well as any written comments received from the MNR (s. 38(2)(c)) based on their review, must be submitted along with the NHA and EIS to the MOE as part of the REA application.

Consideration for the identification and protection of endangered and threatened species protected under the Endangered Species Act is beyond the scope of this report. In consultation with the MNR, wpd and Stantec have been and will be reviewing the implications of this Act to the Project.

2.2 GUIDANCE DOCUMENTS

During the preparation of this report, several guidance documents were referenced to ensure compliance with current standards and agency requirements. These documents include:

- *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a)
- *Bats and Bat Habitats Guideline for Renewable Energy Projects* (MNR, 2011b)
- *Draft Birds and Bird Habitats Guideline for Renewable Energy Projects* (MNR, 2010a)
- *Natural Heritage Reference Manual* (MNR, 2010b)
- *Significant Wildlife Habitat Technical Guide* (MNR, 2000)
- *Ontario Wetland Evaluation System, Southern Manual* (MNR, 2002)

As well, although still in working draft form and not yet in effect, the Draft version of the *Significant Wildlife Habitat Ecoregion Criteria Schedules* (MNR, 2009) was consulted for information purposes.

3.0 Records Review

3.1 METHODS

This records review report was prepared in accordance with O. Reg. 359/09, s. 25 (3).

Background data were collected and reviewed to identify natural features located in, or within, 120 metres of the Project Location. Documents reviewed and agencies contacted as part of the records review included but were not limited to:

Provincial

- Ministry of Natural Resources. Communication with Andrea Fleischhauer, Amy Cameron, Jim Beal, Heather Riddell, Maryjo Tait, September 1, 2011;
- Natural Heritage Information Centre (NHIC) database. 2010. Natural Areas and Species records search. Biodiversity explorer, <http://nhic.mnr.gov.on.ca>. OMNR, Peterborough. Accessed September 6 and 7, 2011;
- Ontario Ministry of Natural Resources (MNR). 2011. Land Information Ontario (LIO) digital mapping of natural heritage features;
- Renewable Energy Atlas (2010) Bat hibernacula mapping;
- *Bats and Bat Habitats. Guidelines for Wind Power Projects*. Ontario Ministry of Natural Resources. July, 2011;
- *Birds and Bird Habitats. Guidelines for Wind Power Projects. Draft*. Ontario Ministry of Natural Resources. October, 2010; and
- Ontario Parks Planning and Management Information. (<http://www.ontarioparks.com/english/plan-res.html>).

Conservation Authority

- St. Clair Region Conservation Authority (SCRCA). Correspondence with Chris Durand, IT / GIS Specialist. September, 2011; and
- St. Clair Region Conservation Authority (SCRCA) regulated areas and natural heritage features mapping (2011).

Local Municipal Government

- Middlesex County Official Plan (2006) and associated schedules; and
- Township of Adelaide-Metcalf Official Plan (2011) and associated schedules.

Other data sources

- Middlesex Natural Heritage Study (2003)
- Important Bird Areas database (Bird Studies Canada and BirdLife International, undated)
- Ontbirds Archives
- Various wildlife atlases (birds, mammals, herpetofauna)

The information received from each source and the manner in which it was used to identify natural features, provincial parks or conservation reserves that exist within 120 m of the Project Location (50 m for Earth Science ANSIs) is detailed below (Section 2.2). The Records Review Report provided by MNR for the Napier Wind Project is found in **Appendix C**.

3.2 RESULTS

A review of available background information has indicated the presence of known natural features occurring within the Project Study Area. The results of the records review search were used to determine whether the Project Location is in a natural feature, within 50 m of an Earth Science ANSI, or within 120 m of other natural features (as defined in Section 1.2).

3.2.1 Wetlands

Based on the records review one wetland complex is known to occur within the vicinity of the Study Area. Information on this wetland was obtained through LIO mapping, the NHIC database and MNR correspondence (**Appendix C**). The location in relation to the Study Area is presented on Figure 1, Appendix A.

Provincially Significant Wetlands

Kerwood Swamp – This wetland is composed of 100% swamp, and is located approximately 1 km south of the closest Project component (an access road). No portion of this wetland complex extends to within 120 m of the Project Location.

Coastal and Locally Significant Wetlands

No coastal wetlands or locally significant wetlands were identified within the Study Area during the records review (MNR Correspondence, 2011; LIO, 2011; Middlesex County Official Plan, 2006; Township of Adelaide-Metcalf Official Plan, 2011).

Unevaluated Wetlands

No unevaluated wetlands were identified in or within 120 m of the Project Location through the record review (MNR Correspondence, 2011; LIO, 2011; Middlesex County Official Plan, 2006; Township of Adelaide-Metcalf Official Plan, 2011).

Summary

No wetlands were identified in or within 120 m of the Project Location through the record review.

3.2.2 Areas of Natural and Scientific Interest (ANSIs)

MNR identifies two types of ANSIs; life science and earth science (NHRM, 2010). Life Science ANSIs are significant representative areas of Ontario's biodiversity and natural landscapes, while Earth Science ANSIs are geological in nature and consist of some of the more significant representative examples of bedrock, fossils and landforms in Ontario.

No provincially significant earth science or life science ANSIs were identified in or within 120 m of the Project Location through the records review (LIO, 2011; NHIC, 2011; Middlesex County Official Plan, 2006; Township of Adelaide-Metcalf Official Plan, 2011; and MNR Correspondence, 2011).

3.2.3 Valleylands

Valleylands are linear natural areas that occur in a valley or other landform depressions that have water flowing through or standing for some period of the year (NHRM, 2010b).

The identification and evaluation of significant valleylands based on the recommended criteria from MNR (i.e. surface and groundwater functions, landform prominence, ecological features and functions) is typically the responsibility of planning authorities (municipalities) (MNR, 2010b). Under O. Reg 359/09 proponents engaging in a renewable energy project must identify the presence and boundaries of valleylands that occur within 120m of the Project Location.

The St. Clair Region Conservation Authority (SCRCA) has identified regulation areas (which can include valleys, floodplains, slopes and/or wetlands). Additionally, the Township of Adelaide-Metcalf has mapped hazard lands. Hazard Lands are mapped within 120 m of the Project Location (Township of Adelaide-Metcalf Official Plan, 2011; SCRCA, 2011). These can be used to help identify the potential presence of valleylands.

The Conservation Authority and Township identified regulation areas were compared to aerial photography, topographic mapping and a review of other identified natural features (i.e. linear vegetated communities) to identify valleylands occurring in or within 120 m of the Project Location. Topographic mapping indicates that the Study Area is relatively flat with little change in elevation.

No known valleylands were identified in or within 120 m of the Project Location through the record review.

3.2.4 Woodlands

The Study Area is located in the Niagara section of the Deciduous Forest Region (Rowe, 1972). This area is also known as the Carolinian Forest. The extreme southern tip of Ontario represents the maximum northern limit of Carolinian Forest. Forests in this region are dominated by broadleaved trees including sugar maple, American beech, basswood, red maple, red oak, white oak and bur oak, butternut, bitternut hickory, rock elm, silver maple and blue beech. Species such as black cherry, black walnut, sycamore, swamp white oak and shagbark hickory are also occasionally present. Species considered rare to the province such as pignut hickory, tulip-tree, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumber-tree, paw paw, Kentucky coffee-tree, red mulberry and sassafras are sporadically present. Needle-leaved trees such as hemlock, white pine, tamarack, eastern white cedar, eastern red cedar and black spruce may be found in isolated patches where soil and other microclimate conditions are favorable.

MNR's LIO mapping (2011) and aerial photography indicate the Napier Study Area is predominately agricultural. According to Riley and Mohr (1994), Middlesex County contains approximately 13.5% woodland cover.

No woodlands were identified in the Project Location. MNR mapping (LIO, 2011) shows two woodlands extending to within 120 m of the Project Location (**Figure 2: Features 1 and 2**).

Significant woodlands have been mapped by both Middlesex County and Township of Adelaide-Metcalf. One woodland located within 120 m of the Project Location (Feature 2) is considered significant for size (> 4 ha) by the Township (Township of Adelaide-Metcalf Official Plan, 2011) while no woodlands within 120 m were considered significant by the County (Middlesex County Official Plan, 2006).

Woodlands found within 120 m of the Project Location are shown on **Figure 2, Appendix A**.

3.2.5 Provincial Parks and Conservation Reserves

There were no provincial parks or conservation reserves identified in or within 120 m of the Project Location through the records review (NHIC, 2011; Ontario Parks 2010).

3.2.6 Wildlife Habitat

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle and that are important to migratory and non-migratory species (O.Reg. 359/09; MNR, 2010b). These are grouped into four categories (i.e., seasonal concentration areas, rare vegetation communities or specialized habitats, movement corridors and habitats of species of conservation concern).

A compilation of background information on known wildlife use within the vicinity of the Study Area was undertaken. Using this information, a preliminary assessment was conducted to identify wildlife habitat features that may be present in, or within, 120 m of the Project Location to determine whether the area contains confirmed significant wildlife habitat (SWH).

No Important Bird Areas (IBAs) are found in or within close proximity to the Study Area (IBA, undated). The Study Area is located inland, more than 35 km from the nearest Great Lakes shoreline (Lake Huron). Land use within the regional landscape is predominately agricultural (Middlesex Natural Heritage Study, 2003).

Air photo interpretation indicates that the Project Location footprint is sited entirely within actively managed agricultural lands. Natural wildlife habitat found within 120 m of the Project Location is primarily restricted to small isolated woodlands and occasional hedgerows (LIO, 2011; NHIC, 2011).

Secondary source data were used to determine potential wildlife use of the Study Area. Wildlife inventory data documented for the Study Area was compiled from available literature and resources including the Atlas of the Mammals of Ontario (Dobbyn, 1994), the Ontario Herpetofaunal Summary (Oldham and Weller, 2000) and the Ontario Breeding Bird Atlas (Cadman et al., 2007). Based on a review of background information, 96 species of birds, 23 species of mammals, 9 species of amphibians and 7 species of reptiles are known to occur within the range of the Study Area (Appendix D). It is important to note that the exact location of species occurrences are not available from these atlases and, instead, are recorded within 10 x 10 km squares. The potential for species to be present within the Project Location will be limited by the habitat suitability and availability supported by the Study Area. Therefore the identified species recorded from these databases may not occur within the Napier Wind Project Location.

3.2.6.1 Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. The Significant Wildlife Habitat Technical Guide (SWHTG) (MNR, 2000) identifies 14 potential types of seasonal concentration areas.

The 14 types of seasonal concentrations are:

- winter deer yards;
- moose late winter habitat;
- colonial bird nesting sites;
- waterfowl stopover and staging areas;
- waterfowl nesting sites;
- shorebird migratory stopover areas;
- landbird migratory stopover areas;
- raptor winter feeding and roosting areas;
- Wild Turkey winter range;
- Turkey Vulture summer roosting areas;
- reptile hibernacula;
- bat hibernacula;
- bullfrog concentration areas; and
- migratory butterfly stopover areas.

The Napier Project Location is situated in southern Ontario. A review of background information was completed to assess the potential for seasonal concentration areas in this region of Ontario. Results of the review are provided below. Moose late winter habitat is not known to occur in the region and does not apply to this Project Location. Wild Turkey winter range and Turkey Vulture summer roosting areas are no longer considered components of significant wildlife habitat and as such do not require consideration within this assessment (MNR correspondence 2012; **Appendix C**).

Winter Deer Yards

Deeryards are areas of key winter habitat for white-tailed deer. They usually consist of a core area of coniferous forest, which provides shelter from snow and wind, adjacent to an area of deciduous forest or other foraging habitat. White-tailed deer are known to occur in the vicinity of the Study Area (Dobbyn, 1994) however deer yards are not common in this area (MNR correspondence, 2011).

There are no identified deer yards located within the Project Study Area (MNR correspondence, 2011; LIO, 2011).

Colonial Bird Nesting Sites

Colonial bird nesting sites can be located in swamps and along large bodies of water for herons, islands for gulls and cliffs, banks and artificial structures for swallows (MNR, 2000).

No heron or gull nesting was confirmed within the 10 km square encompassing the Study Area during Ontario Breeding Bird Atlas field surveys however nesting of Bank Swallow, Cliff Swallow and Barn Swallow was confirmed (Cadman et al., 2007).

Site investigations were conducted to determine whether colonial bird nesting sites are found in or within 120 m of the Project Location (**Section 4.0**).

Waterfowl Stopover and Staging Areas

Areas generally considered candidate significant wildlife habitat for waterfowl staging areas are very large wetlands, associated with lakes that generally have a diversity of vegetation communities interspersed with open water (MNR, 2000). Marshes along Great Lakes shorelines are considered particularly valuable (MNR, 2000).

No waterfowl stopover and staging areas are known to occur within the Study Area.

Site investigations were conducted to determine whether the habitat to support this type of seasonal concentration area is supported in or within 120m of the Project Location (**Section 4.0**).

Waterfowl Nesting Sites

Waterfowl nesting habitat typically includes upland habitat that is located near marshes, ponds or lakes. Sites considered candidate significant wildlife habitat for waterfowl nesting typically contain a high density of small and medium sized ponds, or are single wetlands that are large and diverse (MNR, 2000).

No waterfowl nesting sites are known to occur within the Study Area.

Site investigations were conducted to determine whether the habitat to support this type of seasonal concentration area is supported in or within 120m of the Project Location (**Section 4.0**).

Shorebird Migratory Stopover Areas

Relatively undisturbed shorelines along the Great Lakes that produce abundant food (clams, insects, snails and worms) are used by shorebirds during migration (MNR, 2000). The Napier Project Location is not located along a Great Lakes shoreline and is not considered to be

located in an area that would constitute candidate significant wildlife habitat for a shorebird stopover area.

Landbird Migratory Stopover Areas

Areas that provide a diversity of habitat types ranging from open grasslands to large woodlands within 5 km of the Lake Erie or Lake Ontario shorelines are considered potential candidate significant wildlife habitat for migrating landbird stopover areas (MNR, 2000).

The Napier Project Location is located inland. It is not located within 5 km of a Great Lakes shoreline and is not located in an area that would constitute candidate significant wildlife habitat for a migratory landbird stopover area.

Winter Raptor Feeding and Roosting Areas

Hay fields, pastures and open meadows that support large and productive small mammal populations can provide critical winter feeding areas (MNR, 2000). The best roosting sites are typically found in relatively mature mixed or coniferous woodlands that abut windswept fields, with scattered trees and fence posts providing perches for hunting (MNR, 2000).

Christmas Bird Counts are conducted annually between December 14 and January 5 by volunteers at thousands of North American and international locations. Species and numbers of birds are tallied within a 24 km diameter circle. There is a Count circle, centered on the town of Strathroy that is adjacent to the Napier Study Area (National Audubon Society, 2011). Data from the Strathroy Christmas Bird Count indicates regular use of the count circle by wintering raptors. Notable winter raptor observations over the last ten years of count data include an average of 60 Red-tailed Hawks a year (with annual numbers ranging from 27- 104) and an average of 23 Rough-legged Hawks (annual numbers ranging from 6 – 45 birds). Wintering Short-eared Owls have also been reported in three of the past ten years; 13 in 2001, 4 in 2008 and 6 in 2010.

Winter raptor surveys were conducted within the Napier Study Area during December 2009, January and February 2010 by Stantec Consulting Ltd. Very low raptors/kilometre were recorded in the Study Area and no concentration areas were observed. A total of five raptors were observed in the Study Area (4 Red-tailed Hawks and one Rough-legged Hawk); of these a single Red-tailed Hawk was the only observation that occurred within 120 m of the Project Location. Survey results are summarized in Table 3.1 (**Appendix B**).

Site investigations were conducted to determine whether candidate significant wildlife habitat for winter raptor feeding and roosting areas is supported in or within 120 m of the Project Location (**Section 4.0**).

Reptile Hibernacula

Potential hibernacula include features that would provide a route underground, such as buried concrete or rock. Frequently, hibernacula can be found among talus or karst areas.

The project is located within the ranges of several species of snakes (Appendix D; Oldham and Weller, 2000). There are no known reptile hibernacula in or within 120 m of the Project Location.

Site investigations were conducted to determine whether the habitat features to support this type of seasonal concentration area were found in or within 120m of the Project Location (**Section 4.0**).

Bat Hibernacula and Maternity Roosts

Hibernacula

Bats require specific environmental conditions for hibernating. These conditions are provided by features such as caves or abandoned mines (MNR, 2000). Karst topography and areas of exposed bedrock can be indicators of potentially suitable hibernacula habitat for bats.

No known bat hibernacula have been identified within the Study Area (Renewable Energy Atlas, 2010).

The record review indicates that the habitat features that would support bat hibernacula (i.e., caves, karst topography, abandoned mines) are not present in, or within 120 m of the Project Location (AMIS database, 2011; Brunton, 2008).

Maternity Roosts

Depending on the species, maternity roosts for bats can include tree foliage, tree cavities and crevices under loose bark, or buildings. Within southern Ontario, most bat roosts occur within human structures with natural roosts not commonly known (Bringham, 1991; Kunz, 1982).

Candidate significant wildlife habitat for bat maternity roosts may be found in mixedwood or deciduous forests that contain a high density (ten per hectare or more) of large diameter (25 cm dbh or more) snags or cavity trees (MNR 2011b). The best candidate trees or snags for bat maternity roosts within these habitats are considered according to the following criteria (in order of importance); those that are the tallest, have cavities or crevices, have a large dbh, are within the highest density of snags/cavity trees, have a large amount of loose, peeling bark, have a cavity or crevice more than 10 m high, is a species that provides good cavity habitat, is within an open canopy and exhibits early stages of decay.

There are no known maternity roosts in the Study Area (MNR personal communication, 2011).

Site investigations were conducted to determine whether candidate significant wildlife habitat for bat maternity roosts extends to within 120m of the Project Location (**Section 4.0**).

Bullfrog Concentration Areas

Bullfrogs are found in deep, permanent water with abundant emergent plants and are considered area-sensitive, requiring at least 1 ha of suitable habitat (MNR, 2000).

While the Study Area is found within the range of bullfrog, no bullfrog concentration areas are known to occur within the Study Area (Oldham and Weller, 2000; LIO 2011; MNR correspondence 2011).

Site investigations were conducted to determine whether the habitat to support this type of seasonal concentration area is found in or within 120m of the Project Location (**Section 4.0**).

Migratory Butterfly Stopover Areas

During fall migration, monarchs tend to move along the north shore of the Great Lakes (Calvert, 2001). Fields and other open areas with varied habitat types that are found within 5 km of the Lake Erie or Lake Ontario shoreline are considered candidate significant wildlife habitat for migratory butterfly stopover areas (MNR, 2000).

The Napier Study Area is not located along a Great Lakes shoreline and is not considered to be in an area that would serve as a significant butterfly stopover.

3.2.6.2 Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (MNR, 2000). While river valleys, riparian areas and linkages between known wildlife habitats can serve as corridors, hedgerows can also serve as small linkages (MNR, 2000).

No known animal movement corridors were identified in the Study Area (LIO, 2011). A review of aerial photography indicates the presence of small linear hedgerows within 120 m of the Zone of Investigation.

3.2.6.3 Rare Vegetation Communities or Specialized Habitats

Rare Vegetation Communities

A search of the NHIC database did not identify any records of known rare vegetation communities in or within 120 m of the Project Location. Aerial photo interpretation and a review of available background information also indicate that there are no known rare vegetation

communities in or within 120 m of the Napier Project Location (LIO, 2011; NHIC, 2011; Middlesex County Official Plan, 2006; MNR Correspondence, 2011).

The presence of rare vegetation communities in and within 120 m of the Project Location will be confirmed during site investigations (**Section 4.0**).

Specialized Habitats

Specialized habitats are microhabitats that are critical to some wildlife species. The SWHTG (MNR, 2000) identifies the following potential specialized habitats:

- habitat for area-sensitive species;
- forests providing a high diversity of habitats;
- old-growth or mature forest stands;
- foraging areas with abundant mast;
- amphibian woodland breeding ponds;
- turtle nesting habitat;
- specialized raptor nesting habitat;
- moose calving areas;
- moose aquatic feeding areas;
- mineral licks;
- mink, otter, marten, and fisher denning sites;
- highly diverse sites;
- cliffs; and
- seeps and springs.

A review of background information to assess the potential for specialized habitats that are associated with southern Ontario to be supported in the Study Area is provided below. Moose calving area, aquatic areas and mineral licks are not found within this part of the province and are not included within this assessment. Also, foraging areas with abundant mast must be located within the Great Lakes-St. Lawrence forest region. Because this project is located within the Carolinian forest region, this habitat type will not be considered within this assessment.

Forests providing a high diversity of habitats and highly diverse areas are not considered components of significant wildlife habitat for Renewable Energy projects and as such are not included within this assessment (MNR correspondence 2012; **Appendix C**).

Habitats for Area-Sensitive Species

The NHA Guide (Appendix D of MNR 2011a) identifies interior forest breeding bird and open country breeding bird habitat as specific specialized habitats. Ontario Breeding Bird Atlas information indicates that the 10x10 km atlas squares that encompass the Napier Study Area contain records of forest and open country area sensitive breeding birds (**Appendix D**).

Interior Forest Breeding Birds

Woodlands larger than 30ha are considered to have the potential to support and sustain populations of area-sensitive forest species (MNR, 2000). Woodlands must provide interior habitat (ie. at least 200m from the woodland edge), which is influenced by the woodland size and shape (MNR, 2000). As indicated in Section 3.2.4, the record review indicates that woodland habitat within 120 m of the Project Location is restricted to two woodlands (Feature 1 and 2; **Figure 2, Appendix A**). Both features are considerably smaller than 30ha (2.5 and 7.3 ha respectively) and would not be considered candidate significant wildlife habitat for area-sensitive woodland birds.

Open Country Breeding Birds

Large, contiguous undisturbed grasslands of at least 30 ha (and preferably 50 ha or more) are considered likely to support and sustain a diversity of grassland species (MNR, 2000). The Napier Study Area is predominately used for high intensity agriculture and land cover consists primarily of cut wheat. Grassland habitat with the potential to be considered candidate significant wildlife habitat is not known to be present within 120m of the Project Location.

The record review indicates that candidate significant wildlife habitat for area-sensitive species is not supported in or within 120 m of the Napier Project Location. Site investigations were conducted to confirm this conclusion (**Section 4.0**).

Old-growth or Mature Forest Stands

Old growth forests are characterized by having a large proportion of trees in older age classes, many of them over 120 to 140 years old (MNR, 2000). These forest stands are rare throughout Ontario, particularly in southern Ontario, largely due to past logging practices. Old (i.e. more than 120 years old) undisturbed forest stands that have experienced little or no forestry management would be considered candidate significant wildlife habitat.

Site investigations were conducted to determine the presence of these features in and within 120m of the Project Location (**Section 4.0**).

Amphibian Woodland Breeding Ponds

Woodland ponds may provide important habitat for local amphibian populations. Ponds that contain a variety of vegetation structure in and around the edge of the pond, are undisturbed and are found adjacent to closed canopy woodlands with dense undergrowth that maintain a damp environment typically provide the best ponds for breeding (MNR, 2000).

The Ontario Herpetofaunal Summary (Oldham and Weller, 2000) indicates the Project Study Area falls within the range of a number of common amphibian species. Woodlands are present within 120 m of the Project Location and may provide amphibian habitat.

Site investigations were conducted to determine whether candidate significant wildlife habitat for amphibian woodland breeding is present within 120 m of the Project Location (**Section 4.0**).

Turtle Nesting Habitat

Sandy or fine gravel soils are a requirement for turtle nesting (MNR, 2000). Areas that would be considered candidate significant wildlife habitat for turtle nesting include areas containing sandy or fine gravel soils (i.e. shoreline beaches) adjacent to turtle habitat (weedy wetlands, lake or river shorelines).

No turtle nesting areas are known to occur within the Study Area. The Napier Project Location is not located along a shoreline beach, river or lake. Site investigations will determine the presence of these features in and within 120m of the Project Location.

Specialized Raptor Nesting Habitat

The Significant Wildlife Habitat Technical Guide indicates that some raptors require somewhat specialized habitats.

Bald Eagle and Osprey

Under the criteria and guidelines outlined in Appendix Q of the SWHTG (MNR, 2000) critical habitat features that would support specialized Bald Eagle and Osprey nesting habitat are identified as waterbodies with fish populations and trees with good visibility and flight lines. Bald Eagle nests are found primarily along the Great Lakes shorelines in Ontario.

There are no known Osprey or Bald Eagle nests within the Study Area (LIO, 2011; Cadman et al., 2007).

Woodland Raptor Nesting Habitat

During Ontario Breeding Bird Atlas field surveys Red-tailed Hawk nesting was confirmed within the 10x10 km atlas square that encompasses the Napier Study Area (Cadman et al., 2007). Sharp-shinned Hawk and Cooper's Hawk were also observed within the square (Appendix D).

Site investigations were conducted to determine the presence of candidate significant wildlife habitat for specialized woodland raptor nesting in and within 120 m of the Project Location (see Section 4.0).

Mink, Otter, Marten and Fisher Denning Sites

Mink, otter, marten and fisher are predators that have specific habitat components that are critical to their survival. Marten, otter and fisher are found on the Canadian Shield and their range does not extend to within the Napier Study Area (Dobbyn, 1994). Mink are found throughout southern Ontario and prefer natural undisturbed shorelines dominated by coniferous or mixed forests for feeding and denning (MNR, 2000). Mink are dependent on the presence of aquatic components such as lakes, ponds or rivers.

The Napier Study Area is not found in a shoreline location and aerial photography indicates that no open aquatic features are found in or within 120 m of the Project Location. The record review indicates that candidate significant wildlife habitat for mink denning sites is not supported in or within 120 m of the Napier Project Location. Site investigations were conducted to confirm this conclusion (**Section 4.0**).

Cliffs

Cliffs are dominated by bedrock with sharp or variable broken edges and a vertical relief greater than three metres (MNR, 2000).

The Napier Study Area does not contain the geological or topographic conditions necessary to support cliffs. No cliffs are present in or within 120 m of the Napier Project Location (MNR correspondence, 2011).

Seeps and Springs

Seepage areas and springs provide habitat for numerous uncommon species and may support a high diversity of plant species (MNR, 2000). In winter, these areas provide foraging opportunities for Wild Turkey and white-tailed deer (MNR, 2000). Those that occur within forested areas where the canopy maintains cool, shaded conditions are most important (MNR, 2000). There are no known seeps or springs within the Study Area; the presence of seeps and springs in and within 120 m of the Project Location was identified during site investigations (**Section 4.0**).

3.2.6.4 Species of Conservation Concern

Species of conservation concern include four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk from certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe.

Rare species are considered at five levels: globally rare, nationally rare (with designations by COSEWIC), provincially rare, regionally rare (at the Site Region level), and locally rare (in the municipality or Site District). This is also the order of priority that should be assigned to the importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to habitat loss and species such as woodland raptors that may be vulnerable to forest management or human disturbance. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

Rare Species

NHIC, wildlife atlases and information provided by MNR (**Appendix C**) was used to identify historic records of species of conservation concern that occur in the vicinity of the Study Area. A total of 2 plant species, 1 butterfly, 1 reptile, and 2 birds were identified as occurring within the range of the Napier Study Area. A summary of these species, as well as the habitat characteristics that support these species, is provided in Table 3.2 (**Appendix B**). This list of potential species at risk and their habitat requirements was cross referenced with habitat mapping, aerial photography and vegetation classifications to determine the suitability of the Study Area to support them.

Consideration for the identification and protection of endangered and threatened species protected under the Endangered Species Act is beyond the scope of this report. Information required with regards to endangered and threatened species is being submitted to MNR under separate cover.

Declining Populations

The Ontario Partners In Flight (PIF) program has identified a number of species that are considered conservation priorities for Bird Conservation Region ("BCR") 13 (Lower Great Lakes/St. Lawrence Plain region of southern Ontario) (Ontario PIF, 2008).

Ontario Breeding Bird Atlas information indicates that atlas squares that encompass the Napier Study Area contains records of 21 PIF identified species. These include grassland/agricultural

birds, forest birds, shrub/successional species and species are considered habitat generalists (**Appendix D**).

As discussed above in Section 3.2.6.3, the record review indicates that candidate significant wildlife habitat for woodland and grassland species is not supported in or within 120 m of the Napier Project Location, however, site investigations were conducted to confirm this conclusion (**Section 4.0**).

3.2.7 Summary of Natural Features and Boundaries Identified

No wetlands, ANSIs, valleylands, provincial parks or conservation reserves were identified in or within 120 m of the Napier Project Location through the record review.

No natural features are known to occur in the Project Location. The following known natural features occur within 120 m of the Project Location:

- Woodland (in Features 1, 2).

No known components of significant wildlife habitat were identified in or within 120 m of the Project Location through the records review. As site specific information for many components of significant wildlife habitat is not commonly available, a site investigation is required to confirm the presence and boundaries of candidate significant wildlife habitat features in or within 120 m of the Napier Project Location.

4.0 Site Investigation

Site investigations were conducted in accordance with O. Reg 359/09, s. 26 (1), Natural Heritage Site Investigation. This report is prepared in accordance with s. 26 (3) with guidance provided from the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a).

Site investigations in support of this report were completed with the purpose of confirming the status and boundaries of natural features identified through the records review and identifying any additional features. Data collected during the records review concerning natural features and species occurrences were used to guide the scope and direction of site investigations. The Napier Project Location is sited within actively farmed agricultural fields and has been sited more than 120 m from the majority of natural features in the Project Study Area.

MNR was consulted on the proposed site investigation work program and data requests for the Napier Wind Project. Background data on known natural features was provided by MNR on August 29, 2011 (**Appendix C**). MNR was consulted regarding the Project and the workplan on September 1, 2011.

No natural features are known to occur in the Project Location. The following known natural features occur within 120 m of the Project Location:

- Woodland (in Features 1 and 2)

4.1 METHODS

Land access was available for all land parcels where components of the wind project are proposed. The Project Location and associated 120 m Zone of Investigation (where property access was available) was traversed on foot and physically inventoried.

Field surveys undertaken detail current conditions in and within 120 m of the Project Location. The location of all field investigations was based on the information about the Project lands and layout that was current at the time of the respective survey. Dates, times, duration, field personnel and weather for each field survey are presented in Table 4.1 (**Appendix B**).

4.1.1 Vegetation Community and Vascular Plants Assessment

A botanical inventory and Ecological Land Classification (ELC) of the vegetation communities in the Project Study Area was conducted on August 19 and November 11, 2011. Survey times, weather conditions and field personnel are summarized in **Table 4.1, Appendix B**.

Vegetation communities were delineated on aerial photographs and checked in the field. Vascular plant species lists were recorded separately for each community.

characterizations were then based on the ELC system and have been identified to the Vegetation Type unit level (Lee et al., 1998). English colloquial names and scientific binomials of plant species generally follow Newmaster et al. (1998).

Specific emphasis was placed on searching for plant species of conservation concern that were identified through the records review with historical occurrences within the Region (**Table 3.2, Appendix B**).

Plant species were considered rare if designated provincially as S1 (critically imperiled), S2 (imperiled) or S3 (vulnerable). Species having a high coefficient of conservatism (9 or 10) as designated by Oldham et al. (1995) were also considered species of note.

4.1.2 Wetland Confirmation and Delineation

Site investigations were undertaken August 19 and November 11, 2011 to confirm the presence and extent of wetland communities that occur within 120 m of the Project Location.

Wetland communities were identified and delineated using methods outlined by Ontario Wetland Evaluation System (OWES) Southern Manual protocol (OMNR, 2002). In this evaluation system wetlands are defined as *'lands that are seasonally or permanently flooding by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants'*. The principal criterion for determining the boundary of wetlands is the species composition of the plant community. In general, the wetland – upland boundary is drawn through the zone of transition where upland species of trees and shrubs represent 50% of the woody species present. Where tree and shrub species are either not present or are inconclusive, the herbaceous layer is then used to assist in identifying the boundary.

Survey dates, times, weather conditions and field personnel are summarized in **Table 4.1, Appendix B**.

4.1.3 Woodlands

The limits of all woodlands that occur, or partially occur, within 120 m of the Project Location were delineated through aerial photo interpretation and verified through field investigations. Information regarding woodland size, ecological function and uncommon characteristics was collected during ELC surveys and through GIS analysis.

Treed areas identified during vegetation surveys were compared to the definition of woodlands provided in O. Reg. 359/09 and the NHA Guide (MNR, 2011a) to delineate the limits of "woodlands". A woodland is considered as a treed area, woodlot or forested area, other than a cultivated orchard or Christmas tree plantation. In determining the boundaries of woodland,

openings of 20 m or less between crown edges (including public roads, railways etc.) were not considered to divide the woodland into two features (MNR, 2011a).

In addition to assessing vegetation communities and surveying plant species, information relating to the attributes and functions of each woodland occurring within 120 m of the Project Location was collected during field investigations. Tree height, estimated stand age, presence of large and mature tree trees, snags, cavities, stick nests, disturbance and specialized habitat features such as seeps, springs and vernal pools were recorded and detailed if present.

4.1.4 Wildlife and Wildlife Habitat

Ecological Land Classification Surveys (**Section 4.1.1**) were conducted to determine whether the required ELC ecosites to support candidate significant wildlife habitat components are present in or within 120 m of the Project Location.

Additionally, surveys to determine the presence of habitat features that would support specific components of significant wildlife habitat as outlined in the Significant Wildlife Habitat Technical Guide (MNR, 2000) were conducted. Survey times, weather conditions and field personnel are summarized in **Table 4.1, Appendix B**. Wildlife habitat surveys focused on identifying any wildlife habitat features that occurred within 120 m of the Project Location such as seeps, springs, vernal pools, potential reptile hibernacula, exposed rock crevices or inactive animal burrows, weasel denning sites, raptor nests, heronries etc., as well as assessing the presence of supporting habitat features such as snags, downed debris, logs and tree cavities.

Information on ecosites and habitat features present in and within 120 m of the Project Location were compared to the definitions of candidate significant wildlife habitat provided in the SWHTG (with reference to the Ecoregion Criteria) to determine the presence of candidate significant wildlife habitat components in and within 120 m of the Project Location.

4.2 RESULTS

A summary of the corrections to the features, or potentially occurring features, identified through the records review as a result of the Site Investigation program is outlined in **Table 4.2, Appendix B**.

The Project Location, and associated 120 m is comprised primarily of actively cultivated cropland (wheat, corn and soy). No natural habitat is located in the Project Location. Natural habitat found within 120 m of the Project Location consists of one cultural woodland, one cultural plantation, one deciduous swamp, small patches of cultural meadow and hedgerows. Vegetation communities found within 120 m of the Project Location are shown on **Figure 2, Appendix A** and described in **Table 4.3, Appendix B**. All field notes for the site investigation are provided in **Appendix E**.

A map showing the boundaries of all natural features located within 120 m of the Project Location, the location and type of each natural feature and the distance from the Project Location to the natural feature boundaries as confirmed through site investigations is provided in Figure 3 (**Appendix A**).

Site investigations identified three discrete natural features within 120 m of the Project Location. Feature 1 and 3 were woodlands while Feature 2 contained woodland and wetland. These are discussed below.

Within the Napier Project Location, 34 vascular plant species were recorded. Of that number, 17 species (50%) are native and 17 species (50%) are exotic. All of the native plant species are ranked S5 (secure).

No provincially or federally rare, threatened, endangered, or locally rare species were observed. A complete list of vascular plant species recorded in the Study Area is provided in **Appendix F**.

Natural habitat in and within 120 of the Project Location was limited. A total of 3 butterflies, 1 amphibian, 15 birds, and 2 mammals, were observed in the Study Area. A list of wildlife species identified in the Napier Study Area is provided in **Appendix G**.

4.2.1 Wetlands

Provincially Significant Wetlands

No provincially significant wetlands were identified in or within 120 m of the Project Location through the record review. The site investigations confirmed that no provincially significant wetlands were located in or within 120 m of the Project Location. No corrections are required to the records review (**Table 4.2, Appendix B**).

Locally Significant Wetlands

No locally significant wetland communities were identified in or within 120 m of the Project through the record review. The site investigations confirmed this. No corrections are required to the records review (**Table 4.2, Appendix B**).

Additional Wetlands

No wetlands were identified in the Project Location during the record review. However, one additional wetland unit, not identified during the record review, was identified within the 120 m Zone of Investigation during site investigations (within 120 m of the proposed feeder line).

Feature 2 was a 7.3 ha green ash swamp, dominated by green ash with white elm as an associate.

Wetlands identified during the site investigation that occurred within 120 m of the Project Location are listed in **Table 4.3, Appendix B** and are shown on **Figure 3, Appendix A**. Corrections made to the records review for wetlands as a result of the site investigations are summarized in **Table 4.2 (Appendix B)**. An evaluation of significance is required and has been completed (**Section 5.2.1**).

4.2.2 Valleylands

A valleyland is defined as a natural area that is south and east of the Canadian Shield and occurs in a valley or other landform depression that has water flowing through or standing for some period of the year (MNR, 2011a). Section 5.5 of the NHA Guide (MNR, 2011a) was used to guide the identification of valleylands within the Study Area. Site investigations confirmed that the topography of the Project Study Area is generally flat. No landform depressions were present. ELC and vegetation assessments confirmed that no linear vegetated systems are present (**Figure 2, Appendix A**). No valleylands were identified in, or within 120 m of the Project Location.

No corrections were required to the results of the record review as a result of the site investigation (**Table 4.2, Appendix B**).

4.2.3 Woodlands

Two woodlands were identified within 120 m of the Project Location through the record review (LIO, 2011). No woodlands were identified in the Project Location. Site investigations confirmed the presence of two woodlands (a white elm cultural woodland and a green ash swamp) as well as the addition of another woodland (mixed cultural plantation) within 120 m of the Project Location (**Figure 2, Appendix A**). The plantation is young (tree height under 6m) and actively managed. Lee et al. (1998) does not distinguish such communities from older plantations higher habitat values, and/or natural regeneration; thus this unit is conservatively classified as a cultural plantation for the purposes of this report.

Site investigations also confirmed that no woodlands are present within the Project Location.

A description of the attributes, composition and functions for the woodlands is provided in **Table 4.3, Appendix B**.

Corrections made to the records review for woodlands as a result of site investigations are summarized in **Table 4.2, Appendix B**. An evaluation of significance is required and has been completed (**Section 5.2.2**).

4.2.4 Wildlife and Wildlife Habitat

Results of the site investigation program are provided below to identify natural features supported by the Project Location. The results are considered within the context of criteria for significant wildlife habitat as outlined within the Significant Wildlife Habitat Technical Guide (MNR, 2000) in order to determine whether the Project Location supports candidate significant wildlife habitat.

The Project Location is sited in cultivated agricultural fields. The 120 m of Investigation is also comprised primarily of agricultural fields with wildlife habitat limited to the three woodlands (one each of cultural woodland, young cultural plantation, and deciduous swamp), hedgerows, and two small patches of cultural meadow.

4.2.4.1 Seasonal Concentration Areas

No known seasonal concentration areas were identified in the Study Area through the record review. The results of the site investigation were used to confirm the presence/absence of candidate significant wildlife habitat within 120 m of the Project Location.

Colonial Bird Nesting Sites

Swamps and large bodies of water can support heronries. For swallows, colonial nesting sites can include cliffs, banks and artificial structures.

No evidence of colonial bird nesting sites (i.e. heronries, eroding banks, sandy hills, pits, steep slopes or rock faces) was identified in or within 120 m of the Project Location during field work completed in the Study Area (**Appendix E**).

Waterfowl Staging/Stopover

Areas considered candidate significant wildlife habitat for waterfowl stopover and staging are generally large wetlands or marshes associated with shorelines (MNR, 2000).

The Project Location, and associated 120 m is comprised primarily of actively cultivated cropland (wheat, soy and corn). Site investigations confirmed large wetland features were absent from the Study Area (**Figure 2, Appendix A**). Habitat that would be considered candidate significant wildlife habitat for waterfowl stopover/staging (i.e. large wetlands or shoreline marshes) was absent from in or within 120 m of the Project Location.

Waterfowl Nesting Sites

Waterfowl nesting habitat typically includes upland habitat that is located near marshes, ponds or lakes. Sites considered candidate significant wildlife habitat for waterfowl nesting typically contain a high density of small and medium sized ponds, or are single wetlands that are large and diverse (MNR, 2000).

Although one swamp (Feature 2) was identified within 120 m of the Napier Project Location, this swamp was small, isolated, uniform, and did not contain open water. No marsh communities were identified within 120 m of the Project Location. Important habitat components required to support significant waterfowl nesting areas such as clusters of pond habitats or flooded or poorly drained landscapes were not present (**Figure 2, Appendix A; Appendix D**). Candidate significant wildlife habitat for seasonal concentration areas supporting waterfowl nesting sites is considered absent in or within 120 m of the Napier Project Location.

Raptor Winter Feeding and Roosting Areas

With reference to the Significant Wildlife Habitat Technical Guide (MNR, 2000) candidate significant wildlife habitat for wintering raptor sites include large open fields, including cultural meadows cultural thickets, cultural woodlands or cultural savannahs, that are relatively undisturbed with good perching habitat and are adjacent to coniferous, mixed or deciduous woodland.

The site investigation confirmed that the Napier Project Location is located entirely within intensively managed agricultural lands. Open field habitat is restricted to two small (0.4 and 0.08 ha) pockets of cultural meadow.

Candidate significant wildlife habitat for winter raptor feeding and roosting area was not found in or within 120 m of the Project Location.

No candidate significant wildlife habitat was present in or within 120 m of the Project Location for Turkey Vulture roosting.

Reptile Hibernacula Assessment

No potential snake hibernacula features such as rock crevices or abandoned animal burrows were identified for the Project Location and 120 m Zone of Investigation during field investigations (**Appendix E**).

The Project Location does not support known candidate significant wildlife habitat for reptile hibernacula.

Bat Maternity Roosts

Candidate significant wildlife habitat for bat maternity roosts may be found in mixedwood or deciduous forests that contain a high density (ten per hectare or more) of large diameter (25 cm dbh or more) snags or cavity trees (MNR 2011b).

Woodlands 1, 2 and 3 are within 120 m of the Project Location. Both woodlands 1 and 3 are young aged cultural communities; snags were not observed and the communities did not contain large diameter trees. Woodland 2 was a mature deciduous swamp community. No

snags or trees meeting the criteria to be considered candidate wildlife habitat for maternity roosts were observed within the feature (**Appendix E**).

No natural critical habitat features were identified within 120 m of the Project Location that may support significant maternity colonies. The Project Location does not support candidate significant wildlife habitat for seasonal concentration areas for bats. No evaluation of significance is required.

Bullfrog Concentration Area

Bullfrogs are found in deep, permanent water with abundant emergent plants and are considered area-sensitive, requiring at least 1 ha of suitable habitat (MNR, 2000).

Site investigations confirmed that the open water habitat required by bullfrogs is not found in or within 120 m of the Project Location (**Figure 2, Appendix A; Appendix E**) and the Project Location or 120 m Zone of Investigation did not support candidate significant wildlife habitat for seasonal concentration areas for bullfrog concentration areas.

4.2.4.2 Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (MNR, 2000).

As indicated in the SWHTG (MNR, 2000), it is seldom possible to observe wildlife species using corridors. ELC site investigations, mapping and aerial photography were used to assess the potential of areas with sufficient vegetation cover, natural areas and enough connectivity across the landscape to be considered candidate significant wildlife habitat.

Candidate significant wildlife habitat should include corridors at least 200 m wide, that are unbroken by roads or gaps such as fields and contain several layers of native vegetation (MNR, 2000). The Napier Project Location is found entirely within actively managed agricultural fields. Very few hedgerows are present within 120 m of the Project Location. Those that are present are narrow (i.e. <5 m wide), sparsely vegetated hedgerows that are divided by the agricultural fields and roads. The canopy cover of these features was limited. The hedgerows are considered to have limited utility for wildlife, primarily due to their narrow width, limited tree cover and low degree of connectivity. Hedgerows within 120 m of the Napier Project Location did not meet the dimensions, continuity or habitat structure criteria to be candidate animal movement corridors as defined in the SWHTG (MNR, 2000).

The Project Location does not support candidate significant wildlife habitat for animal movement corridors.

4.2.4.3 Rare Vegetation Communities or Specialized Habitats

Rare Vegetation Communities

No rare vegetation communities were identified during site investigations in or within 120 m of the Project Location (**Table 4.4, Appendix B; Figure 2, Appendix A; and Appendix E**).

Area-Sensitive Breeding Birds

Interior Forest Breeding Birds

Woodlands that are considered to have the potential to support and sustain populations of area-sensitive forest species must provide interior habitat (ie. at least 200m from the woodland edge), which is influenced by the woodland size and shape (MNR, 2000).

Site investigations confirmed the presence of three woodlands within 120 m of the Project Location. Woodlands 1, 2 and 3 are 2.5, 7.3 and 1.7 ha respectively. They do not contain interior forest habitat. As a result, these woodlands do not have the potential to support and sustain populations of area sensitive species and are not considered candidate significant wildlife habitat for area-sensitive species.

Open Country Breeding Birds

Large, contiguous undisturbed grasslands of at least 30 ha (and preferably 50 ha or more) are considered likely to support and sustain a diversity of grassland species (MNR, 2000). The Napier Study Area is predominately used for high intensity agriculture and land cover consists primarily of cut wheat.

The site investigations confirmed that the wind project components are sited entirely within intensively managed agricultural fields, while the feeder line is sited within a municipal right of way. No large undisturbed grassland habitat was found in or within 120 m of the Project Location.

No candidate significant wildlife habitat for area-sensitive species was found in or within 120 m of the Project Location.

Old-growth or Mature Forests

Old (i.e. more than 120 years old) undisturbed forest stands that have experienced little or no forestry management would be considered candidate significant wildlife habitat for old-growth or mature forest stands (MNR, 2000).

Site investigations confirmed the presence of three woodlands within 120 m of the Project Location. Feature 1 was a young open cultural woodland, feature 2 was a mid-aged (but successional mature) swamp, while feature 3 was a very young cultural plantation.

No woodlands meeting the definition of old-growth (i.e. more than 120 years old) were identified in or within 120 m of the Project Location. No candidate significant wildlife habitat is present in or within 120 m of the Project Location for old-growth forests.

Amphibian Breeding Habitat

Woodland ponds may provide important habitat for local amphibian populations. Ponds that contain a variety of vegetation structure in and around the edge of the pond, are undisturbed and are found adjacent to closed canopy woodlands with dense undergrowth that maintain a damp environment typically provide the best ponds for breeding (MNR, 2000).

The review of aerial photography and site investigations carried out for Features 1, 2 and 3 did not identify any vernal pools or evidence of areas containing standing water. However, given feature 2 consists of a deciduous swamp community, it is considered generalized candidate wildlife habitat for the purposes of this report in accordance with Appendix D of the Natural Heritage Assessment Guide (MNR, 2011).

Turtle Nesting Habitat

Sandy or fine gravel soils are a requirement for turtle nesting (MNR, 2000). Areas that would be considered candidate significant wildlife habitat for turtle nesting include areas containing sandy or fine gravel soils (i.e. shoreline beaches) adjacent to turtle habitat (weedy wetlands, lake or river shorelines).

Lakes or rivers are not found within 120 m of the Project Location. ELC and habitat assessment surveys indicated that areas containing standing water are absent from in or within 120 m of the Project Location.

No candidate significant wildlife habitat is present in or within 120 m of the Project Location for turtle nesting habitat.

Specialized Raptor Nesting

No raptor nests were observed during the course of site investigations and candidate significant wildlife habitat for specialized raptor nesting sites is considered absent from in or within 120 m of the Project Location.

Mink Denning

Mink are found throughout southern Ontario and prefer natural undisturbed shorelines dominated by coniferous or mixed forests for feeding and denning (MNR, 2000). Mink are dependent on the presence of aquatic components such as lakes, ponds or rivers.

Site investigations confirmed that the aquatic habitat components required by mink are absent from in or within 120 m of the Project Location (**Figure 2, Appendix A; Appendix E**).

Candidate significant wildlife habitat for mink denning sites is considered absent from in or within 120 m of the Project Location.

Seeps and Springs

No seeps or springs were identified during site investigations (**Appendix E**). Candidate significant wildlife habitat for specialized habitats (seeps and springs) was not found in or within 120 m of the Project Location.

4.2.4.4 Species of Conservation Concern

Rare Species

All of the native plant and animal species recorded within the Project Study Area are ranked S5 (secure in Ontario) or S4 (apparently secure in Ontario); except giant swallowtail (*Papilio cressphontes*), ranked S3 (rare) (**Appendix F and G**).

A single swallowtail was observed during fall migration (August 19, 2011). The only resident populations of giant swallowtail in Canada occur in extreme southwestern Ontario (Point Pelee). Elsewhere in southern Ontario it is considered rare and sporadic. The species appears to be restricted in range by the presence of its known food plants and climate (NHIC, 2011). Giant Swallowtail have been recorded using Hop Tree and Northern Prickly Ash in Ontario (Layberry et al., 1998). These plant species did not occur in or within 120 m of the Project Location (**Appendix F**). The species is not considered a resident to the study area and candidate significant wildlife habitat for giant swallowtail was not found in or within 120 m of the Project Location.

Results of the site investigation and habitat assessment for each species of conservation concern identified through the records review are provided in **Table 3.2, Appendix B**.

Consideration for the identification and protection of endangered and threatened species protected under the Endangered Species Act is beyond the scope of this report. Information required with regards to endangered and threatened species is being submitted to MNR under separate cover.

Declining Breeding Birds

As discussed in Section 4.2.4.3, woodlands found within 120 m do not meet the minimum size criteria to be considered candidate significant wildlife habitat for woodland species. The site investigations also confirmed that the wind project components are sited entirely within intensively managed agricultural fields, while the feeder line is sited within a municipal right of way. No shrub/successional habitat or large undisturbed grassland habitat was found in or within 120 m of the Project Location. (**Table 4.4, Appendix B**).

No candidate significant wildlife habitat for declining (grassland, woodland or shrub/successional) species was found in or within 120 m of the Project Location.

4.3 SITE INVESTIGATION RESULTS SUMMARY

The identification of natural features in the records review and as confirmed through the site investigation program is provided in **Table 4.3, Appendix B** and shown on **Figure 3, Appendix A**. Corrections made to the records review are provided in **Table 4.2, Appendix B**.

No natural features occurred in the Project Location. The following natural features were identified or confirmed through site investigations as occurring within 120 m of the Project Location and require an evaluation of significance:

- Wetland (in Feature 2); and
- Woodland (in Features 1, 2, and 3).

The evaluation of significance for each of these features is provided in **Section 5.1.2 and 5.2.2**, respectively.

4.4 QUALIFICATIONS

Personnel responsible for conducting the site investigation are listed in **Table 4.1, Appendix B**. Curricula vitae are provided in Appendix H.

5.0 Evaluation of Significance

Natural heritage information collected from the records review, the site investigation and consultations were analyzed to determine the significance and sensitivity of existing ecological features and functions. For all natural features existing in, or within 120 m of, the Project Location a determination was made of whether the natural feature is provincially significant, significant, not provincially significant or not significant.

Comments and information received from MNR were used to assist in the evaluation of significance.

No natural features occurred in the Project Location. The following natural features were identified or confirmed through site investigations as occurring within 120m of the Project Location and require an evaluation of significance:

- Wetland (in Feature 2);
- Woodland (in Features 1, 2, and 3); and
- Generalized candidate significant wildlife habitat (Feature 2).

These are shown on Figure 3, Appendix A. Specific methods used in the evaluation of significance for each type of natural feature are detailed below.

5.1 METHODS

5.1.1 Wetlands (Feature 2)

One wetland feature not evaluated by MNR is found within 120 m of the Project Location.

The wetland (feature 2) was assessed using a method for Wetland Characteristics and Ecological Functions Assessment (MNR, 2011a) to provide a set of evaluation criteria focused on wetland attributes relevant to the completion of an Environmental Impact Statement (EIS) for renewable energy projects. The criteria to be evaluated are presented in Appendix C of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a). All wetlands assessed under this approach are considered as provincially significant for the purposes of the NHA and project siting, and will be treated as such (MNR, 2011a).

Data were collected through desktop procedures (e.g. aerial photograph interpretation) and on-site field investigations conducted from the property boundary. The criteria and procedures found within Appendix C of the Draft *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a) are based on sections of the OWES – Southern Edition (MNR, 2002).

Although this procedure does not evaluate the significance of these wetlands, it provides a procedure by which the significance of these wetlands can be assumed and their functions assessed based on the criteria established within the OWES manual. Specifically, these criteria were addressed in the following manner:

Biological Component

Wetland Size: This figure will be based on the overall size of the contiguous wetland, including areas that are within but extend outside of 120m zone. Data will be based on field surveys and/or aerial photo interpretation. (OWES Section 1.3)

Wetland Type: The dominant wetland type in the contiguous unit will be listed. Data will be based on field surveys and/or aerial photo interpretation. (OWES Section 1.1.2)

Site Type: The wetland site type will be stated. Data will be based on field surveys and/or aerial photo interpretation. (OWES Section 1.1.3)

Vegetation Communities: Each vegetation community in the contiguous unit will be listed, based on the requirements of OWES. Data will be based on field surveys where possible. (OWES Section 1.2.2)

Proximity to Other Wetlands: The approximate distance to the next closest wetland unit will be provided. Data will be based on field surveys and/or aerial photo interpretation. (OWES Section 1.2.4)

Interspersion: An estimate of the total number of interspersion points will be provided, with consideration given to the scale of the map and complexity of the wetland type delineations. The interspersion number will be provided in the Table. Data will be based on field surveys and/or aerial photo interpretation. (OWES Section 1.2.5)

Open Water Types: The open water type number (page 52 of the OWES manual) will be listed in the Table; data will be based on field surveys and/or aerial photo interpretation. (OWES Section 1.2.6)

Hydrological Component

Flood Attenuation: The general proximity of the wetland within the local watershed will be stated, indicating if it is headwater, mid-reach, or river-mouth. An estimate of the catchment area will also be provided, either based on Digital Elevation Mapping, or topographic map interpretation.

Water Quality Improvement (Short Term):

- *Watershed Improvement Factor (WIF)* – this is based on presence/absence of specific site types (i.e. riverine, lacustrine wetlands at lake inflow or outflow; or palustrine wetlands with inflow isolated wetlands, or palustrine wetlands with no inflow or lacustrine wetlands on lake shoreline. The data will be derived from field surveys where possible [OWES Section 3.2.1.1]):
- *Adjacent and Watershed Land Use (LUF)* – estimated percent of land use and land use type (i.e. agricultural, urban or forested) was included for the catchment (data derived from field surveys where possible [OWES Section 3.2.1.2]):
- *Pollutant Uptake Factor (PUT)* – this is based on the single *most* dominant vegetation form observed within the wetland community (data derived from field surveys where possible [OWES Section 3.2.1.3]), described as:
 - high proportion of emergent, submergent, and/or floating vegetation.
 - a high proportion of live trees, shrubs, herbs, or mosses.
 - a high proportion of wetland with little or no vegetation.

Water Quality Improvement (Long Term Nutrient Trap): Wetlands with a retentive capacity for nutrients (e.g., those with organic soils) provide protection for recharging groundwater. A characterization of wetland type and soil conditions is provided. Data was based on field surveys where possible, or soil series mapping (OWES Section 3.2.2):

- *Water Quality Improvement (Groundwater Discharge):* OWES establishes eight wetland features that provide evidence of discharge, where the evaluator must make observations on as many of the features as possible (OWES Section 3.2.3). Where available, data indicative of groundwater discharge was provided.
- *Shoreline Erosion Control:* Shoreline wetlands provide a measure of protection from shoreline erosion caused by flowing water or waves. A description of the dominant shoreline vegetation was provided based on field surveys and/or aerial photo interpretation (OWES Section 3.4):
- *Groundwater Recharge (Site Type):* Site type was included based on field surveys where possible (OWES Section 3.5.1):
- *Groundwater Recharge (Soils):* Soil type was indicated for each wetland unit, based on county soil mapping. (OWES Section 3.5.2)

Special Features

Species Rarity: All rare species observed during field surveys or species known to be present were documented and listed in the Wetland Characteristics and Ecological Functions Assessment (WCEFA) results table (Table 5.3). Data was based on field surveys, review of background materials (including existing wetland evaluations), and correspondence with agencies where possible (OWES Section 4.1.2).

Significant Features and Habitats: All significant features and habitats present in the wetland was documented and listed in the Table. Features/Habitat of interest include Colonial Waterbird Habitat, Winter Wildlife Cover, Waterfowl Staging and/or Moulting Areas, Waterfowl Breeding, and Migratory Passerine, Shorebird, or Raptor Stopover Areas. Data will be based on field surveys, background data, and correspondence with agencies where possible (OWES Section 4.2). Information on significant deeryards, obtained from Land Information Ontario (LIO) mapping, was also reviewed.

Fish Habitat: OWES (guided by the Canada Fisheries Act) states that the presence of individual species of fish is not scored. Instead, fish habitat values are based on presence spawning and nursery habitat, and presence of staging and migration habitat. An indication of presence/absence was provided, as well as its hydro-period (i.e., permanent or intermittent). (OWES Section 4.2.6)

5.1.2 Woodlands (1, 2, and 3)

An assessment of woodland significance was applied to each woodland identified in or within 120 m of the Project Location, using the guidance and criteria outlined in MNR's *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a). Criteria to be used to evaluate the significance of woodlands include woodland size, interior, proximity to other natural features, linkages, water protection, diversity, and uncommon characteristics.

Woodlands are to be assessed within the context of the regional landscape and standards for each criteria vary based on the percentage of woodland cover in the municipality where the project is proposed.

The Napier Project is located in Middlesex County, which contains approximately 13.5% woodland cover (Riley and Mohr, 1994). In areas with 5-15% woodland cover the minimum standards are:

Woodland Size- woodlands are considered significant if they are greater than 4 ha.

Woodland Interior- woodlands are considered significant if they have any interior habitat (defined as more than 100m from the edge).

Proximity to other significant woodlands or habitats- woodlands are considered significant if they are located within 30m of an identified significant feature or fish habitat *and* the woodland is 1 ha or larger

Linkages- woodlands are considered significant if they are located between two other significant features each of which is within 120 m *and* the woodland is 1 ha or larger

Water Protection- woodlands are considered significant if they are located within 50m of a sensitive hydrological feature (i.e. fish habitat, groundwater discharge, headwater area) and the woodland is 0.5 ha or larger

Woodland diversity- woodlands are considered significant if they have an area dominated by native natural occurring woodland species *and* the woodland is 1 ha or larger

Uncommon characteristics- woodlands are considered significant if they have uncommon species composition, cover type, age or structure or are older than 100 years old *and* the woodland is 1 ha or larger

Woodlands that meet the minimum standard for any one of these criteria are considered significant.

5.1.3 Wildlife Habitat

Appendix D of the Natural Heritage Assessment Guide (MNR, July 2011) was used to assist in the identification and evaluation of candidate significant wildlife habitats. Features considered “Generalized Candidate Significant Wildlife Habitat” using Appendix D are treated as existing and are to be considered significant.

5.2 RESULTS

5.2.1 Wetland (Feature 2)

One wetland community was identified in Feature 2 during site investigations by Stantec and was evaluated using the *Wetland Characteristics and Ecological Functions Assessment for Renewable Energy Projects* described in **Section 5.1.1**. All wetlands assessed under this protocol are considered significant for the purposes of the NHA and project siting, and will be treated as such. **Table 5.1 (Appendix B)** provides the results of the assessment of wetland Feature 2.

No significant wetlands are found in the Project Location. Wetlands treated as significant for the purposes of this report are found within 120 m of the Project Location in Feature 2 and are shown on **Figure 4, Appendix A**.

5.2.2 Woodlands (Features 1, 2, and 3)

The record review and site investigation confirmed that no woodlands occurred in the Project Location while three occurred within 120 m of the Project Location.

Results from the assessment of woodlands according to criteria and standards outlined in MNR's *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a) are provided in Table 5.2, Appendix B. Woodlands meeting at least one of the criteria are considered significant.

According to the evaluation of significance, woodlands 1 and 3 do not meet any of the criteria to be considered significant.

Woodland feature 2 meets three of the seven criteria and is considered significant woodland.

No significant woodlands are found in the Project Location. One significant woodland is found within 120 m of the Project Location (a feeder line) and is shown on **Figure 4, Appendix A**.

5.2.3 Wildlife Habitat

In accordance with Appendix D of the *Natural Heritage Assessment Guide* (MNR, 2011) Feature 2 is considered to provide generalized candidate significant wildlife habitat. This habitat is treated as significant for the purposes of this report.

5.3 SUMMARY

This Natural Heritage Assessment was undertaken to identify natural features found in, and within 120 m of, the Project Location and evaluate their significance. This report has been prepared in accordance with O. Reg. 359/09 s.24-27.

Based on an assessment of background information and the results of on-site field investigations, the following significant natural features were located within 120 m of the Project Location, requiring an Environmental Impact Study (EIS) under O. Reg. 359/09 s.38:

- Significant wetland (Feature 2); Significant woodland (Feature 2); and
- Generalized significant wildlife habitat (Feature 2).

An EIS is required to identify and assess any negative environmental effects and develop mitigation measures to the above-noted significant features that occur within 120 m of the Project Location. No natural features are present in the Project Location.

5.4 QUALIFICATIONS

The following Stantec personnel were responsible for the application of evaluation criteria and procedures:

- Nicole Kopysh, Terrestrial Ecologist and Project Manager (woodland evaluation)
- James Leslie, Terrestrial Ecologist (wetland evaluation)

Curricula vitae are provided in **Appendix H**.

6.0 Environmental Impact Study

The Natural Heritage Reference Manual (2010), the Significant Wildlife Habitat Technical Guide (MNR, 2000) and the SWHTG Decision Support System (SWHTGDSS, undated) were used to assist in the evaluation of impacts and mitigation measures.

The primary mitigation measure employed to reduce impacts to natural features and functions was avoidance; micro-siting decisions made during the development of the Project layout considered minimizing impacts to natural features, wildlife and wildlife habitat. The Project is sited entirely within actively cultivated agricultural land or the municipal right of way and no natural habitat removal is required for the Project.

6.1 PROJECT FOOTPRINT OVERVIEW

All components of the Project and the associated 120 m Zone of Investigation in relation to significant natural features are shown on Figure 4 (**Appendix A**).

The basic components of the Project include two REpower MM92-2.05 MW wind turbine generators, step-up transformers located adjacent to the base of each turbine, a 27.6 kV underground electrical power line system, a switching station, and turbine access roads. Temporary components during construction include work and storage areas at the turbine locations and along access roads and laydown areas. The underground collector system will transport the electricity generated from each turbine to a switching station located on private property at Napperton Road where it will flow through a feeder line to tie into the Hydro One Networks Inc. distribution network. The connection point for the feeder line is at the Corner of Katesville Dr. & Kerwood Rd.

6.2 SIGNIFICANT NATURAL FEATURES OVERVIEW

No natural habitat removal is required for the Project and no Project components are located in any significant features. The Project has been sited entirely in active agricultural cropland with the exception of the feeder line which will be installed within the municipal right of way along Kerwood Road. Project components (a feeder line) occur within 120 m of the following significant natural features:

- Significant wetlands (Feature 2);
- Significant woodlands (Feature 2); and
- Generalized significant wildlife habitat (Feature 2).

Projects may be sited within 120 m of a significant southern wetland and in, or within 120 m of significant woodland and significant wildlife habitat if an environmental impact study is prepared that identifies and addresses any negative environmental effects on the feature and identifies mitigation measures.

Significant features found within 120 m of the Napier Project Location are provided below.

Feature Number	Significant Natural Features	Project Component(s) located in Significant Natural Features	Project Component(s) located within 120 m of Significant Natural Features
Feature 2	Significant wetland	None	Feeder line: 37 m at closest point
	Generalized significant wildlife habitat	None	
	Significant woodland	None	

An analysis of the potential impacts and proposed mitigation measures for each natural feature is provided below. A synthesis of all potential impacts and proposed mitigation measures for the Project for each feature including commitments required as part of the Construction Plan Report and the Environmental Effects Monitoring Plan as applicable is provided in Table 6.1 (Appendix B).

6.3 FEATURE 2

Feature 2 consists of a significant wetland, generalized significant wildlife habitat and significant woodland. A feeder line is the only proposed project component located within 120 m of the feature boundaries, as identified and confirmed through the site investigation program. The feeder line will be installed within the municipal right of way and is located a minimum of 37 m from Feature 2. The Project Location in relation to the wetland/woodland/wildlife habitat boundaries is shown on **Figure 4, Appendix A**.

The feeder line would be installed within the municipal right of way. The feeder line will be a 27.6 kV line. It is yet to be determined whether the line will be above ground, below, or a combination thereof. Should all or part of the line be above ground, then, wood poles would be set to a depth of approximately two to three metres and power lines strung between them.

All activities associated with the installation of the feeder line for the Project would occur within existing municipal right of ways. The majority of work would be completed from vehicles parked in the right of way, including the use of vehicle mounted drilling equipment.

Installation of collector lines and the feeder line in municipal right of way is anticipated to be completed within a two week time period and construction activities required for the installation of the line adjacent to Feature 2 will be completed over the course of a few days.

6.3.1 Potential Effects

Project components found within 120 m of Feature 2 are restricted to the aboveground feeder line that is contained within the municipal road right-of-way and is sited approximately 37 m from the feature boundary. As Project components are sited outside the wetland, wildlife habitat and woodland boundaries there will be no direct loss of wetland, woodland or wildlife habitat as a result of the Project.

The type of construction proposed involves above surface works having little or minimal impact to pervious areas and precludes the potential for effects associated with changes in water influence (i.e. surface and water changes).

All construction activities will occur within the municipal right of way and will be spatially limited to the work area and immediately adjacent area. No grading or removal of natural vegetation is proposed to install the collector line. Any vegetation impacted during construction will be located within the municipal right-of-way and subject to current maintenance operations.

Potential impacts of construction activities to the woodland, wildlife habitat and wetland contained within Feature 2 are considered limited as they are proposed 37 m from the feature boundary.

Given the feeder line is proposed within the municipal right of way along a regularly used municipal roadway, it currently experiences routine impacts from day to day use and maintenance of the roadway. Wildlife using Feature 2 would be accustomed to potential impacts resulting from current levels of activity, such as road noise. As a result, impacts during operation of the line are considered negligible as they will be restricted to occasional system maintenance and do not represent a change in current activity conditions for the feature.

Proposed Mitigation

Given the feeder line is to be placed in the municipal right of way approximately 37 m from wetland boundary with construction and maintenance activities restricted to the municipal road right of way, the potential for impacts from construction and operation of the line is limited and further mitigation (in addition to the distance separation) is not required.

Net Effects

The brief and low impact nature of construction activities within the municipal right of way required for the Project and the low impact of operational maintenance activities would result in minimal negative impacts to the woodland/wetland that is located 37 m away at its closest point.

6.4 SUMMARY OF IMPACTS AND MITIGATION

Table 6.1 (Appendix B) summarizes the general impacts, suggested mitigation measures and application to minimize and mitigate the potential negative impacts to significant natural heritage features associated with the construction and operation of the proposed Project.

6.5 ADDITIONAL REPORTING REQUIREMENTS

In addition to the NHA/EIS the REA Regulation requires that applicants prepare an Environmental Effects Monitoring Plan and a Construction Plan Report.

The Napier Wind Project Construction Plan Report has been prepared. It provides a summary of the potential negative effects to natural features as a result of construction activities and describes how potential negative effects will be mitigated.

In addition, a post-construction monitoring study for bird and bat mortality has been developed in consultation with the Ministry of Natural Resources that is consistent with guidance provided in MNR's Bat Guidelines (2011) and MNR's Bird Guidelines (2010). This is contained within the Environmental Effects Monitoring Plan and is provided in the Napier Wind Project Design and Operations Report. Elements of the post-construction monitoring program include:

- Mortality monitoring, for birds and bats, at all turbines twice-weekly from May 1st - October 31st, with raptor mortality surveys continuing to November 30th for a period of three years.
- Searcher efficiency and scavenger trials conducted each year; and
- Regular reporting that includes analysis and submission of results to MNR.

7.0 Conclusions

This Natural Heritage Assessment and Environmental Impact Study for the Napier Wind Project has been prepared in accordance with O. Reg. 359/09, s. 24-28 and 37-38.

Once the identified protective, mitigation and compensation measures are applied to the environmental features discussed above, the construction and operation of the Project is expected to have no net negative effects on the significant features and functions identified through the Natural Heritage Assessment process. An environmental effects monitoring plan that includes a post-construction monitoring program will be developed to confirm the accuracy of predicted effects as well as to monitor the effects to other natural elements.


Stantec Consulting Ltd. prepared this Natural Heritage Assessment and Environmental Impact Study for wpd for the Napier Wind Project. wpd is committed to implementing the appropriate protection and mitigation measures as they apply to the construction and operation of the proposed Project.

Respectfully Submitted,

STANTEC CONSULTING LTD



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Senior Ecologist

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NAPIER WIND PROJECT

NATURAL HERITAGE ASSESSMENT AND ENVIRONMENTAL IMPACT STUDY

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