

4. Evaluation of Significance

4.1 REA Requirements

Under the REA process, applicants are required to identify natural features in the vicinity of the proposed Project Location and determine whether prohibitions and setbacks apply (O. Reg. 359/09, Sections 37 and 38). In instances where the Project is proposed within such a setback, the applicant must prepare an Environmental Impact Study (EIS) report (Section 38) to identify and assess the potential negative environmental effects that may result from the proposed renewable energy project, identify appropriate mitigation measures and describe how the potential effects will be addressed through the environmental effects monitoring plan and construction plan.

In order to determine whether development prohibitions and setbacks apply, applicants are required to determine whether natural features identified in the Project Location or within 120 m of the Project Location (herein defined as the 120 m Area of Investigation) are Significant or Provincially Significant according to procedures or criteria established or accepted by the Ministry of Natural Resources (MNR). Under Part IV, Section 27 of O. Reg. 359/09, establishing the significance of a natural feature is only a requirement if the Project Location is proposed within 120 m of the natural feature (*i.e.*, wetland, woodland, valleyland, candidate Significant Wildlife Habitat or Life Science ANSI), or within 50 m of an Earth Science ANSI. As an alternative, applicants may choose to treat a natural feature as significant and amend the Project Location to be outside the established setback from the natural feature, in which case an Evaluation of Significance and EIS are not required.

In conducting an Evaluation of Significance, Part IV, Section 27 of O. Reg. 359/09 requires that applicants make use of any available information related to the natural feature including information obtained through the Records Review, through Site Investigations or alternative Site Investigations, and through consultations. If a feature is evaluated and determined to be neither significant nor Provincially Significant, the feature is not subject to development prohibitions.

For some features (e.g., wetlands located outside the Project Location but within the 120 m Area of Investigation, or generalized candidate Significant Wildlife Habitat), MNR has deemed it reasonable for the applicant to treat the feature as significant and carry it forward to the EIS without undertaking an evaluation of significance. In these cases, the applicant must follow criteria and procedures established by MNR to ensure that those attributes of the feature that are necessary to prepare an EIS are considered.

4.2 Methods

The following is a description of the criteria and procedures used to evaluate the significance of features carried forward from the Records Review and Site Investigation to the Evaluation of Significance phase of this NHA.

4.2.1 Wetlands

A total of 14 wetland complexes (or features) were identified in or within the 120 m Area of Investigation through the Records Review and Site Investigation process and were carried forward to the Evaluation of Significance. In the context of the REA process, wetland features can be assessed in two ways: i) by undertaking a full evaluation according to the MNR's Ontario Wetland Evaluation System (3rd edition; December, 2002), or ii) by treating any unevaluated wetland within 120 m of the proposed Project Location (but not within the Project Location itself) as if it is Provincially Significant. More details regarding these two approaches are provided below.

4.2.1.1 *Ontario Wetland Evaluation System*

Section 6.2.1 of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011a) states that, “Provincially Significant Wetlands are those areas identified or confirmed by MNR as being the most valuable within the landscape.” Wetlands are scored using a point-based ranking system found in the Ontario Wetland Evaluation System (OWES). Points are based on four components: Biological, Hydrological, Social and Special Features. A Provincially Significant Wetland is defined as any OWES-evaluated wetland which scores a total of 600 or more points or 200 or more points in either the Biological Component or the Special Features Component.

A wetland that has been evaluated using the criteria outlined in the OWES is known as an “evaluated wetland” and will have a wetland record relating to it. There are two evaluated wetlands at least partially located within the Project Study Area, however, not within the 120 m Area of Investigation. Hay Swamp, a Provincially Significant Wetland, is located within the eastern portion of the Wind Energy Centre Study Area, and O’Brien Swamp, a Locally Significant Wetland, is located within the southwestern portion of the Wind Energy Centre Study Area. Both of these wetlands have been evaluated by MNR and descriptions are provided as part of our background review in the Records Review section of this Natural Heritage Assessment (refer to Section 2.2.2.1).

Several unevaluated wetlands, as identified by the Upper Thames River Conservation Area (UTRCA) and the Ausable Bayfield Conservation Authority (ABCA), are also located within the Project Study Area. These are described in the Records Review section of this Natural Heritage Assessment and can be seen on Figure 2.1. The presence and boundaries of these unevaluated wetlands was assessed during site investigations. Changes made to unevaluated wetland boundaries as determined through Site Investigations are summarized in the corrections to the Records Review section of this report (refer to Section 3.4).

The OWES Southern Manual, outlines rules for the complexing of wetlands. Complexing is a desk-top practice of combining individual wetlands that are geographically close into one large wetland complex. The intent of complexing is to recognize the ecological, hydrological, and hydrogeological interrelationships between wetland patches that are in close proximity to one another. By applying these rules, Hay Swamp and O’Brien Swamp, as well as three other evaluated wetlands, Provincially Significant McDonald Marsh Wetland, Locally Significant Keller Swamp, and Locally Significant Datars-Miller Swamp, form a portion of three different wetland complexes. Hay Swamp and McDonald Marsh Wetland form a portion of WET-012, Keller Swamp and Datars-Miller Swamp form a portion of WET-032 and O’Brien Swamp Wetlands forms a portion of WET-010. These three wetland complexes are partially located within the 120 m Area of Investigation (Figure 3.3); therefore these five evaluated wetlands are components of three wetland features in or within the 120 m Area of Investigation.

4.2.1.2 *Treatment of Unevaluated Wetlands as Significant without a full OWES*

Within the REA process, an unevaluated wetland within 120 m of a proposed project but not within the Project Location can be treated as a Provincially Significant Wetland for the purposes of the Natural Heritage Assessment and EIS Report (MNR, 2011a). However, it should be noted that treating a wetland as significant will not officially define the status of the wetland (either as significant or not significant). Official significance can only be determined through the completion of an Ontario Wetland Evaluation as per the Ministry of Natural Resources Wetland Evaluation System by provincially certified wetland evaluators. An EIS must be conducted on these wetland features that are treated as significant using the procedures outlined in Appendix C of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011a). This assessment focuses on several sections contained within the OWES manual and is to be used as the main reference in determining the character and function of each wetland. Each characteristic/ecological function, its corresponding OWES Manual Section, and a brief description of each is presented below in Table 4.1.

Table 4.1 Wetland Evaluation Criteria

Characteristic/ Ecological Function	OWES Southern Manual Section	Description																
Wetland Size	n/a	• Size of entire wetland including portions outside of the Project Study Area.																
Biological Component																		
Wetland Type	1.1.2	<ul style="list-style-type: none"> • The four wetland types are: Bog, Fen, Marsh and Swamp. • Wetland types are determined in the field on the basis of the major plant associations and physical and hydrological information in the wetland and adjacent communities. 																
Site Type	1.1.3	<ul style="list-style-type: none"> • There are three main site types: Isolated Palustrine, and Riverine: <ul style="list-style-type: none"> ○ Isolated: wetlands with no surface flow; ○ Palustrine: containing either absent or intermittent inflow and either intermittent or permanent outflow; and, ○ Riverine: includes a channel of continuously moving water to a 2 m depth, as well as adjacent wetlands and normal floodplain of rivers and permanent streams. 																
Vegetation Communities	1.2.2	<ul style="list-style-type: none"> • Vegetation communities are documented through notation of dominant forms that represent at least 25% of the community. Plant species for each form, observed during field investigations, are also documented. Forms include: <table border="0" style="margin-left: 40px;"> <tr> <td style="padding-right: 40px;">h: deciduous trees</td> <td>m: mosses</td> </tr> <tr> <td>c: coniferous trees</td> <td>re: robust emergents</td> </tr> <tr> <td>dh: dead deciduous trees</td> <td>ne: narrow-leaved emergents</td> </tr> <tr> <td>dc: dead coniferous trees</td> <td>be: broad-leaved emergents</td> </tr> <tr> <td>ts: tall shrub (1 to 6 m in height)</td> <td>f: floating plants</td> </tr> <tr> <td>ls: low shrub (<1 m in height)</td> <td>ff: free floating plants</td> </tr> <tr> <td>ds: dead shrubs</td> <td>su: submerged plants</td> </tr> <tr> <td>gc: herbs (herbs)</td> <td>U: unvegetated</td> </tr> </table> 	h: deciduous trees	m: mosses	c: coniferous trees	re: robust emergents	dh: dead deciduous trees	ne: narrow-leaved emergents	dc: dead coniferous trees	be: broad-leaved emergents	ts: tall shrub (1 to 6 m in height)	f: floating plants	ls: low shrub (<1 m in height)	ff: free floating plants	ds: dead shrubs	su: submerged plants	gc: herbs (herbs)	U: unvegetated
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Proximity to other wetlands	1.2.4	• Distance between two wetland features.																
Interspersion	1.2.5	• Provides an idea of the presence and length of ecotones or edges that exist between different vegetation communities. As the interspersion of wetland vegetation increases, biodiversity within the wetland is increased.																
Open Water Types	1.2.6	<ul style="list-style-type: none"> • There are 8 different Open Water Types: <ul style="list-style-type: none"> ○ Type 1: Open water occupies less than 5% of the wetland area; ○ Type 2: Open water occupies less than 5-25% of the wetland area, occurring in a central pattern; ○ Type 3: Open water occupies 5-25% of the wetland area, occurring in ponds of various sizes; vegetation occurs in dense patches or diffuse open stands; ○ Type 4: Open water occupies 26-75% of the wetland area occurring over a central area; ○ Type 5: Open water occupies 26-75% of the wetland area, occurring in a pattern where small ponds and embayments are common; ○ Type 6: Open water occupies 76-95% of the wetland area, occurring in a large central area, vegetation is peripheral; ○ Type 7: Open water occupies 76-95% of the wetland area, vegetation occurs in patches or diffuse, open stands; and, ○ Type 8: Open water occupies more than 95% of the wetland. 																
Hydrological Component																		
Flood attenuation	3.1	<ul style="list-style-type: none"> • Ability of a wetland to temporarily hold back water which would otherwise flow downstream. This applies to both riverine and palustrine site types as isolated wetlands have a high flood attenuation by virtue of being isolated. • The three factors which are required to evaluate the hydrological function of flood attenuation under OWES are provided in this criterion. This includes; the size of the wetland, the size of the wetland catchment basin and the size of other detention areas within the catchment basin. 																
Water Quality Improvement	3.2	<ul style="list-style-type: none"> • This heading evaluates the ability of a wetland to improve water quality in both the short term and the long term. Three factors from the OWES manual which were used to evaluate this include; Short Term Water Quality Improvement, Long Term Nutrient Trap and Groundwater Discharge. • The Short Term Water Quality Improvement ability of a wetland was evaluated by determining the percent cover of the surrounding land use which was classified using one of the following selections which were taken from Section 3.2 of the OWES manual: <ul style="list-style-type: none"> ○ Over 50% agricultural and/or urban; ○ Between 30 and 50% agricultural and/or urban; and, ○ Over 50% forested or other natural vegetation. 																

Table 4.1 Wetland Evaluation Criteria

Characteristic/ Ecological Function	OWES Southern Manual Section	Description
		<ul style="list-style-type: none"> • The Long Term Nutrient Trap ability of a wetland was evaluated by determining the wetland type and the percent cover of organic soil which was classified using one of the following selections which were taken from Section 3.2 of the OWES manual: <ul style="list-style-type: none"> ○ Wetland located in a river mouth; ○ Wetland is a bog, fen, or swamp with more than 50% of the wetland being covered with organic soil; ○ Wetland is a bog, fen, or swamp with less than 50% of the wetland being covered with organic soil; ○ Wetland is a marsh with more than 50% of the wetland covered with organic soil; and, ○ Wetland is a marsh with less than 50% of the wetland covered with organic soil. • The Groundwater Discharge ability of a wetland was evaluated by determining the topography of the area, the wetland area to catchment area ratio, the presences of seeps and the wetlands proximity to a major aquifer was classified using the following selections which were taken from Section 3.2 of the OWES manual: <ul style="list-style-type: none"> ○ Topography: <ul style="list-style-type: none"> ▪ Flat/rolling; ▪ Hilly; and, ▪ Steep. ○ Wetland area to upslope catchment area ratio was provided as a percentage. ○ The proximity of the wetland to a major aquifer were classified using the following selections which were taken from Section 3.2 of the OWES manual: <ul style="list-style-type: none"> ▪ Located within 1 km of a major aquifer; and, ▪ Not located within 1 km of a major aquifer.
Shoreline Erosion Control	3.4	<ul style="list-style-type: none"> • The ability of wetland vegetation along lake shores and riverbanks to eliminate or reduce soil erosion is based primarily on vegetation type. Vegetation communities that are established and have strong root systems are more resistant and resilient to erosive forces. As per OWS protocol, this was evaluated by determining the dominant vegetation form of a wetland that was classified as riverine. The following selections, taken from the Section 3.4 of the OWES manual, were used to classify Shoreline Erosion Control: <ul style="list-style-type: none"> ○ Trees and Shrubs; ○ Emergent Vegetation; ○ Submergent vegetation; ○ Other shoreline vegetation; and, ○ No vegetation.
Groundwater Recharge	3.5	<ul style="list-style-type: none"> • A wetland is considered a groundwater recharge area if a component of groundwater flow is downward from the wetland to underlying soils. As per the OWES protocol, this was evaluated by determining the dominant wetland type and dominant soil type for the surrounding area. Surrounding soils were determined using the Soil Survey of Huron County (Hoffman <i>et al.</i> 1952). • The following selections, take from Section 3.5 of the OWES manual, were used to classify the dominant wetland type: <ul style="list-style-type: none"> ○ Lacustrine or major river; ○ Isolated; ○ Palustrine; and, ○ Riverine (not on a major river). • The following selections, take from Section 3.5 of the OWES manual, were used to classify the dominant surrounding soils: <ul style="list-style-type: none"> ○ Sands, loams, gravels; and, ○ Clays, bedrock.
Special Features Component		
Species Rarity (Total)	4.1.2	<ul style="list-style-type: none"> • A rare species includes any indigenous species of flora or fauna that occurs sporadically or in a very restricted area of Ontario, or at the fringe of its range. • There are three levels of significance that were identified in this report including: <ul style="list-style-type: none"> ○ Provincially Significant- as determined by Ontario Ministry of Natural Resources; ○ Regionally Significant (Site Region) – as determined by the municipality or area Conservation Authority; ○ Locally Significant (Site District) – as determined by the municipality or area Conservation Authority; ○ Federally and Provincially Endangered and Threatened – as determined by COSSARO and COSEWIC; and, ○ Federally and Provincially Endangered and Threatened species were not identified within this report in order to ensure that their locations were not released.

Table 4.1 Wetland Evaluation Criteria

Characteristic/ Ecological Function	OWES Southern Manual Section	Description
Significant Features and Habitat (Total)	4.2	<ul style="list-style-type: none"> Wetland may have special importance as wildlife habitat because of their geographic position or the unusual nature of their habitat (<i>i.e.</i>, important winter cover for wildlife, important habitat for colonial birds, important habitat for waterfowl staging and/or molting etc.).
Fish Habitat	4.2.6	<ul style="list-style-type: none"> Based on presence of spawning and nursery habitat, and the presence of staging and migration habitat.

As identified through the Records Review and Site Investigation phases of this NHA, those wetland features which fall in or within the 120 m Area of Investigation, but are located outside the Project Location, include the following fourteen (14) wetland complexes (which together include five evaluated wetlands): WET-006, WET-008, WET-009, WET-010, WET-011, WET-12, WET-014, WET-019, WET-021, WET-025, WET-032, WET-038, WET-049 and WET-053, as presented in Figure 3.3. These were treated as Provincially Significant without going through a full OWES evaluation and were, therefore, assessed using the Wetland Characteristics and Ecological Functions Assessment for Renewable Energy Projects (MNR, 2011a) found in Appendix C of the Natural Heritage Assessment Guide.

Field data required to complete these assessments were collected during Site Investigations. The dates of these field investigations are provided in Table 3.3. Detailed field notes are provided in Appendix B and the qualifications of field personnel are provided in Appendix C. Analysis and field data and completion of this Evaluation of Significance took place between July 15 and August 15, 2012. The wetlands assessment was undertaken by an OWES certified biologist, Jessica Piette. The results of this assessment are provided in Section 4.3.1 below.

4.2.2 Woodlands

A total of 75 woodlands were confirmed in or within the 120 m Area of Investigation through the Site Investigations and carried forward to the Evaluation of Significance. The locations of these woodlands are shown on Figure 3.4. Each woodland feature was evaluated following the criteria set out in Table 8: Significant Woodland Evaluation Criteria and Standards of the REA regulation under Section 6 - Evaluation of Significance of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011a). The following table (Table 4.2) presents the criteria used to evaluate each woodland feature along with a description of the sources used. This evaluation system is based on the percentage of woodland cover found within the corresponding municipality where the Project is located. The Project Study Area overlaps two municipal boundaries; therefore, two woodland cover percentages were taken into account, based on the location of individual woodland features. The Municipality of Bluewater has approximately 16.5% woodland cover, according to the Municipality of Bluewater Official Plan (2005). The Municipality of South Huron has approximately 9.4% woodland cover, calculated by dividing the total area of the Municipality by the area of the Land Information Ontario Wooded Areas data layer (MNR, 2012c). For woodland features partially located in both municipalities, the more conservative woodland cover (South Huron: 9.4%) was used.

Details regarding woodland size, age, species composition, ecological function and uncommon characteristics were collected through a combination of vegetation community surveys and GIS analysis. The water protection criterion was evaluated by overlaying ABCA's Source Water Protection Map 4.3 (ABCA, 2012) for significant groundwater recharge/discharge areas with woodlands identified through the Site Investigation in a mapping environment. The dates of field investigations are shown in Table 3.3, field notes are provided in Appendix B, and the qualifications of field personnel are provided in Appendix C. Analysis and field data and completion of this Evaluation of Significance took place between July 15 and August 15, 2012. The Evaluation of Significance for woodlands was undertaken by a Registered Professional Forester, Sam Gildiner. The results of this evaluation are provided in Section 4.3.2 below.

Table 4.2 Woodland Evaluation Criteria

Criterion	Sources of Information and Methods	Criterion Application
1 Woodland Size	Completed through a combination of: <ul style="list-style-type: none"> • Aerial photograph interpretation; • Boundary confirmation during field investigations; and, • GIS interpretation and calculations. 	Must have an area of at least: <ul style="list-style-type: none"> • Municipality of Bluewater: 20 ha • Municipality of South Huron: 4 ha
2 Ecological Functions		
a) Woodland Interior (100m from edge)	Completed through: <ul style="list-style-type: none"> • GIS calculations for contiguous woodland features; interior habitat is at least 100 m from the edge. 	Must have woodland interior area of at least: <ul style="list-style-type: none"> • Municipality of Bluewater: 2 ha • Municipality of South Huron: Any size
b) Proximity to Other Significant Woodland or Habitats	Completed through a combination of: <ul style="list-style-type: none"> • GIS interpretation and calculations; • Input from Records Review and data collected through Site Investigations for Significant Wildlife Habitat, Significant Wetlands, Significant Valleylands and Provincially Significant ANSIs; and, • Input from biologists undertaking Site Investigations for the Goshen Wind Energy Centre Water Assessment and Water Body Report (AECOM, 2012a). 	Must be within 30 m of a significant natural feature or fish habitat and be at least: <ul style="list-style-type: none"> • Municipality of Bluewater: 4 ha in size • Municipality of South Huron: 1 ha in size
c) Linkages	Completed through a combination of: <ul style="list-style-type: none"> • Input from Significant Wildlife Habitat Section and Records Review data; and, • GIS interpretation and calculations. 	Must be located between 2 other significant features each of which are within 120 m and be at least: <ul style="list-style-type: none"> • Municipality of Bluewater: 4 ha in size • Municipality of South Huron: 1 ha in size
d) Water Protection	Completed through a combination of: <ul style="list-style-type: none"> • Use of Map 4.3 – Ausable Bayfield SPA, Significant Groundwater Recharge Areas (ABCA, 2012); • Data collected on surface water features, including fish habitat, through Site Investigations for the Goshen Wind Energy Centre Water Assessment and Water Body Report (AECOM, 2012a); • GIS interpretation and calculations; and, • Groundwater indicator species observed during field investigations. 	Must be located within 50 m of a sensitive groundwater discharge, recharge, headwater area, watercourse or fish habitat and be at least: <ul style="list-style-type: none"> • Municipality of Bluewater: 2 ha in size • Municipality of South Huron: 0.5 ha in size
e) Woodland Diversity Representation	Completed through: <ul style="list-style-type: none"> • ELC data collected during Site Investigations; and, • Inferences on larger woodland composition based on data collected. 	Must be dominated singly or in combination by native naturally occurring Sugar Maple, Black Maple, Silver Maple, Red Maple, Yellow Birch, Hickory, Beech, Black Ash, Walnut, Tamarack, Spruce, Pine, Oak, Basswood, or Hemlock, and be at least <ul style="list-style-type: none"> • Municipality of Bluewater: 4 ha in size • Municipality of South Huron: 1 ha in size
3 Uncommon Characteristics	Completed through a combination of: <ul style="list-style-type: none"> • NHIC database for provincially rare vegetation types (S1-S3 ranks); • Data collected through Site Investigations regarding composition and attributes; and, • NHIC database on Coefficient of Conservatism. 	Must have rare vegetation community (S1, S2 or S3) and be more than 0.5 ha in size, OR Habitat of a rare, uncommon, or restricted woodland plant species with 10 individual stems or 100 m ² of leaf coverage and be more than 0.5 ha in size, OR Characteristics of older woodlands or woodlands with larger tree size structure in native species and be more than: <ul style="list-style-type: none"> • Municipality of Bluewater: 2 ha in size • Municipality of South Huron: 1 ha in size

4.2.3 Significant Valleylands

Following the Records Review and Site Investigation process, one candidate Significant Valleyland (VAL-02) was identified in or within the 120 m Area of Investigation. Section 6.2.3 of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011a) outlines the criteria to be used for evaluating valleylands. Within this section, criteria for evaluating and identifying valleylands include:

- Landform-related Functions and Attributes:
 - Surface water functions;
- Ecological Features:
 - Degree of naturalness;
 - Linkage functions;
- Restored Ecological Functions:
 - Restoration: Existing/committed projects.

Information required to complete the Evaluation of Significance was collected through a combination of Site Investigation surveys and GIS analysis. The dates of field investigations are shown in Table 3.3, field notes are provided in Appendix B, and the qualifications of field personnel are provided in Appendix C. Analysis and field data and completion of this Evaluation of Significance took place between July 15 and August 15, 2012. The Evaluation of Significance for valleylands was undertaken by Jennifer Paterson. The results of this evaluation are provided in Section 4.3.3 below.

4.2.4 Significant Wildlife Habitat

The following methods have or will be used to evaluate candidate Significant Wildlife Habitats identified through the Records Review and Site Investigation process in order to determine whether these qualify as Significant Wildlife Habitat according to procedures or criteria established or accepted by MNR. As listed below, twelve types of candidate Significant Wildlife Habitat were identified within 120 m of qualifying infrastructure and carried forward to the Evaluation of Significance from the Site Investigation phase of the NHA:

- Waterfowl stopover and staging areas (terrestrial) (WSST-15 and WSST-36);
- Bat maternity colonies (BMC-177, BMC-189, BMC-215, BMC-229, BMC-235, BMC-236, BMC-242, BMC-249, BMC-267, BMC-282, BMC-285, BMC-326, BMC-342, BMC-352, BMC-358, BMC-372, BMC-757, BMC-648 and BMC-720);
- Turtle wintering areas (TOW-01 and TOW-03);
- Reptile hibernacula (RH-01, RH-02, RH-03, RH-04, RH-05, RH-06, RH-07 and RH-08);
- Colonially-nesting bird breeding habitat (tree/shrub) (CNB-01);
- Deer winter congregation area (DWC-01);
- Amphibian woodland breeding habitat (AWO-02, AWO-03, AWO-04, AWO-06, AWO-07, AWO-08, AWO-09, AWO-14, AWO-17, AWO-24, AWO-25, AWO-26, AWO-27, AWO-28, AWO-30, AWO-33, AWO-34 and AWO-35);
- Amphibian wetland breeding habitat (AWE-29);
- Habitats of plant species of conservation concern (SCP-01, SCP-02, SCP-03, SCP-04, SCP-05, SCP-06, SCP-07, SCP-08, SCP-09, SCP-10, SCP-11, SCP-12, SCP-13, SCP-14, SCP-15, SCP-16 and SCP-17);
- Habitats of bird species of conservation concern (Red-headed Woodpecker) (SCB-01, SCB-02, SCB-03, SCB-04 and SCB-05);

- Amphibian corridors (location(s) to be determined following identification of significant amphibian breeding habitats); and
- Deer movement corridors (WOD-331).

As described in Appendix D of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011a), these candidate Significant Wildlife Habitats must be evaluated to determine the significance of the habitat or treated as significant with a commitment made to undertake a study of habitat use in or within 120 m of the habitat prior to construction. The results of these evaluations are provided in Section 4.3.4 below.

In addition, the following potential Significant Wildlife Habitats were identified in or within the 120 m Area of Investigation but not within 120 m of qualifying project infrastructure, and were therefore carried forward to the Evaluation of Significance as Generalized Candidate Significant Wildlife Habitat:

- Bat maternity colonies (numerous; refer to Section 3 of this report);
- Turtle wintering areas (natural areas 255, 266, 609, 720 and 754);
- Reptile hibernacula (natural areas 236, 661 and 695);
- Mature forest stands (numerous; refer to Section 3 of this report);
- Other rare vegetation communities (natural area 309);
- Waterfowl nesting areas (natural area 209);
- Woodland raptor nesting habitat (Woodland units WOD-117, WOD-131 and WOD-331);
- Turtle nesting areas (natural area 209);
- Seeps and springs (natural areas 232, 249, 266, 267, 273, 280, 309, 369, 609 and 723);
- Amphibian woodland breeding habitat (natural areas 209, 210, 232, 236, 255, 266, 269, 280, 309, 342 and 375);
- Amphibian wetland breeding habitat (natural areas 236, 609 and 754);
- Woodland area-sensitive bird breeding habitat (WOD-131 and WOD-331);
- Terrestrial crayfish habitat (natural area 225);
- Habitats of plant species of conservation concern (numerous; refer to Section 3 of this report);
- Habitat of bird species of conservation concern (numerous; refer to Section 3 of this report); and,
- Habitat of insect species of conservation concern (numerous; refer to Section 3 of this report).

As described in Appendix D of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011a), Generalized Candidate Significant Wildlife Habitats within 120 m of the Project Location were treated as significant and carried forward to the EIS.

4.2.4.1 Protocols to Evaluate or Study Candidate Significant Wildlife Habitat

As determined through consultation with MNR, the evaluation of candidate Significant Wildlife Habitat or studies of habitat use must be based on repeatable field protocols, with field work being conducted at the appropriate time of year. The following protocols have or will be used to assess the candidate Significant Wildlife Habitats for which an Evaluation of Significance or study of habitat use is required. These protocols are based on the evaluation criteria outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) (MNR, 2000) and the Ecoregion Criteria Schedule Addendums to the SWHTG for Ecoregion 6E and Ecoregion 7E (MNR, 2011e; MNR, 2011f), and have been approved by MNR. All field investigations have or will be conducted by qualified Biologists. Appendix B contains detailed field notes. Appendix C contains qualifications (i.e., curriculum vitae) for all investigators.

Seasonal Concentration Areas of Animals

The following seasonal concentration areas of animals were identified as potentially occurring in the Project Study Area and requiring Evaluation of Significance or habitat use studies through the Records Review and Site Investigation:

- Waterfowl Stopover and Staging Areas (Terrestrial);
- Bat Maternity Colonies;
- Turtle Wintering Areas;
- Reptile Hibernacula;
- Colonially-nesting Bird Breeding Habitat (Tree/Shrub); and,
- Deer Winter Congregation Areas.

A description of the Evaluation of Significance and/or habitat use study methods pertaining to each of these types of seasonal concentration areas of animals follows.

Waterfowl Stopover and Staging Areas (Terrestrial)

Two candidate Tundra Swan stopover and staging areas (WSST-15 and WSST-36) were carried forward to the Evaluation of Significance due to their proximity to a proposed turbine, visible evidence of annual spring flooding and presence of forage crops (refer to Figure 3.6c for locations).

Information regarding habitat use by Tundra Swans in these features was collected during spring Tundra Swan migration surveys completed in 2010 and 2012 and through consultation with local residents, as described in the Records Review of this Natural Heritage Assessment (refer to Sections 2.1.3.1 and 2.2.2.4). This information will be used in conjunction with additional surveys to evaluate the significance of these features.

The Evaluation of Significance surveys will be conducted in March 2013 on three occasions approximately one week apart during the peak migratory period, which typically occurs in March but can range from mid-February to mid-April. Surveys will be conducted between sunrise and noon, during the most active period for Tundra Swans, and under calm, clear weather conditions, to the extent possible. Weather conditions (wind, cloud cover, temperature), start time and end time will all be recorded during each survey. One survey station will be placed per 0.5 km of candidate Tundra Swan stopover and staging habitat and be monitored for approximately 15 minutes. During each survey all observed waterfowl will be recorded along with their approximate location, age and behaviour. MNR will be consulted if the above survey protocol cannot be followed due to property access constraints to determine an appropriate course of action.

The number and density of observed waterfowl will be calculated to determine if these sites meet the target for Significant Wildlife Habitat (*i.e.*, contains aggregations of 100 or more Tundra Swans, and is likely to do so annually).

Bat Maternity Colonies

Seventeen candidate significant bat maternity colonies (BMC-177, BMC-189, BMC-215, BMC-229, BMC-235, BMC-236, BMC-242, BMC-249, BMC-267, BMC-282, BMC-285, BMC-326, BMC-342, BMC-352, BMC-358, BMC-372, BMC-757, BMC-648 and BMC-720) were identified through the Site Investigation as occurring in woodlands found within 120 m of proposed wind turbines or woodlands proposed to be overlapped by the transmission line (refer to Figure 3.6c for locations). Candidate significant bat maternity colonies in the Project Study Area were evaluated by NRSI (Natural Resource Solutions Inc.). NRSI biologists conducted through-the-night acoustic bat monitoring at 8 locations in woodlands within 120 m of proposed wind turbines in 2010 and 2011, according to the 2010 draft guidance document *Bats and Bat Habitats: Guidelines for Wind Power Projects* (MNR 2010b). This monitoring was

conducted from dusk until 5 hours after (i.e., 2000–0100hrs) on a total of 42 and 40 nights for 2010 and 2011 respectively, totalling more than 713 hours of monitoring data. In addition, active visual and acoustic monitoring was undertaken to establish if any woodlands monitored may contain bat maternity colonies. These surveys were conducted between sunset and midnight, and consisted of ten minute surveys at each point count location. Details pertaining to the survey methods, dates, locations and field personnel are provided in the Goshen Wind Energy Centre Bat Monitoring Report and Environmental Impact Study (NRSI, 2012), appended to this report (Appendix G).

The Evaluation of Significance was conducted using evaluation criteria outlined in applicable guidance documents, including the SWHTG (MNR, 2000), and the Ecoregion Criteria Schedules addendum to the SWHTG, for Ecoregions 6E and 7E (MNR, 2011e; MNR, 2011f). Details regarding the Evaluation of Significance for bat maternity colonies are provided in Appendix G.

As a result of site investigations which were completed after the end of the 2011 bat monitoring period, an additional 11 woodlands were identified to contain suitable habitat for a bat maternity colony but could not be evaluated for significance during the appropriate monitoring season. For the purposes of this report, these habitats have been treated as significant with the commitment to conduct pre-construction monitoring within these habitats to confirm whether these features are significant. Pre-construction monitoring will be conducted in accordance with the July 2011 Bat and Bat Habitats provincial guidelines (MNR, 2011g) as follows.

“Acoustic bat monitoring will occur at 10-30 candidate maternity colony trees in each woodland. Each tree will be surveyed once in June prior to construction from one half hour before dusk until one hour after dusk to observe evidence of bats exiting. Monitoring will use high-powered spotlights and acoustic detectors to record species calls.”

Significant maternity colonies include at least 20 northern long-eared bats (*Myotis septentrionalis*) or little brown bats (*Myotis lucifugus*), 10 big brown bats (*Eptesicus fuscus*), or 5 adult, female, silver-haired bats (*Lasionycteris noctivagans*) (MNR 2011e; MNR, 2011f). The number of individuals observed exiting or entering candidate trees, combined with species recorded and their representation of total calls recorded at each tree, will be used to determine the number of individuals of each species utilizing a candidate tree. MNR will be consulted if the above survey protocol cannot be followed due to property access constraints to determine an appropriate course of action.

Turtle Wintering Areas

Two features (TOW-01 and TOW-03) were identified as candidate significant turtle wintering areas requiring Evaluation of Significance or habitat use study because they consists of permanent ponds that are approximately 3 m deep and are located within 120 m of a proposed access road (refer to Figure 3.6a).

Over wintering areas may be identified by searching for congregations (basking areas) of turtles on warm, sunny days during the spring. The vicinity of each potential turtle wintering feature will be examined on three occasions between late March and early May, 2013, where permission to access has been granted. To the extent possible, surveys will be conducted under ideal weather conditions, being calm, clear or partly cloudy and with a temperature above 10 degrees Celsius. On each visit, the feature will be approached slowly and scanned for the presence of basking turtles with binoculars from several metres back. An area search will be conducted by slowly walking around the perimeter of the feature while scanning the ground for turtles. The feature will be searched for a minimum of 20 minutes. Any turtles found will be visually identified, approximate length estimated, and other visible characteristics recorded (where possible). This will be done to identify individuals which will help determine the number of turtles present if other turtles are found on subsequent visits. A field sheet will be prepared to record weather, habitat conditions, UTM's of observations, details of any encountered turtles, as well as time and date. MNR will be consulted if the above survey protocol cannot be followed due to property access constraints to determine an appropriate course of action.

Any turtle wintering habitat used by five or more Midland Painted Turtles or one or more Northern Map Turtle or Snapping Turtle will be considered significant as prescribed by the Draft Ecoregion 6E and 7E Criterion Schedule Addendums to the SWHTG (MNR, 2011e; MNR, 2011f). The mapped area of the ELC Ecosite containing the wintering turtles will be considered to form the Significant Wildlife Habitat.

Reptile Hibernacula

Eight features (RH-01, RH-02, RH-03, RH-04, RH-05, RH-06, RH-07 and RH-08) were identified as candidate significant reptile hibernacula requiring Evaluation of Significance studies because they consist of rock piles or old foundations with the potential to extend below the frost line and are either located within 120 m of a proposed access road or turbine location or are overlapped by the Project Location when a 30 m buffer is applied to the potential hibernaculum (refer to Figure 3.6a). If hibernating snakes are present, they may occasionally be seen on the pile/foundation or nearby grass in spring or autumn. However, snakes are often partially or entirely concealed in the grass or they may be among the loose stones or debris in the pile, so they are difficult to detect even if present. The presence of snakes can be easier to confirm by using cover objects since many species readily take cover under boards or tin sheets, particularly during spring and early autumn.

The vicinity of each potential hibernaculum (RH-01, RH-02, RH-03, RH-04, RH-05, RH-06, RH-07 and RH-08) will be examined on three occasions between mid-April and mid-May, 2013. To the extent possible, surveys will be conducted under ideal weather conditions, being calm, clear or partly cloudy and with a temperature in the range of 10 to 20 degrees Celsius. On each visit the potential hibernaculum will be approached slowly and scanned for the presence of snakes with binoculars from several metres back. An area search will be conducted by slowly walking a circle 5 m out from the edge of the pile while scanning the ground for snakes. The hibernaculum will be searched for a minimum of 20 minutes. If large stones or other cover objects (e.g., boards) are present, these will be overturned carefully since snakes may be hiding under them. Any snakes found will be visually identified, approximate length estimated, and visually sexed by amount of tail tapering (if possible). This will be done to identify individuals which will help determine the number of snakes present if other snakes are found on subsequent visits. A field sheet will be prepared to record weather, habitat conditions, location of cover objects, UTM coordinates of observations, details of any encountered snakes as well as time and date. MNR will be consulted if the above survey protocol cannot be followed due to property access constraints to determine an appropriate course of action.

Snake hibernacula used by 5 or more individuals or 2 or more species of snakes, or congregations of 5 or more individuals or 2 or more species of snakes near potential hibernacula are to be considered significant (MNR, 2011e; MNR, 2011f). The feature (e.g. rock pile) in which the hibernaculum is located as well as an additional 30 m buffer applied to that feature will be considered to form the Significant Wildlife Habitat.

Colonially-nesting Bird Breeding Habitat (Tree/Shrub)

One feature (CNB-01) was identified as a candidate significant colonially-nesting bird breeding habitat through the Site Investigation, where a Great Blue Heron colony was identified in natural area 189 (refer to Figure 3.6b). Permission to access the property on which this heronry is located was denied, however observations were made from the fence line of an adjacent property on several occasions over two field seasons. During breeding bird surveys conducted in 2011, nest activity was recorded on two separate occasions. On May 25, 2011, a stick nest and three adult Great Blue Herons were observed. At that time, Great Blue Herons calls were heard further north and northeast from the woodland edge indicating the possibility of other nests. On a second visit conducted on July 3, 2011, two adult Great Blue Herons were observed leaving or entering the nest and Great Blue Heron young were also observed. During ELC surveys conducted on April 26, 2012, one stick nest was observed approximately 25 m from the edge of the deciduous forest. Five or six Great Blue Herons were observed either perched in trees in the vicinity of the stick nest or flying around the area.

Although Evaluation of Significance studies to confirm the number of nests is not possible due to the lack of property access, this evidence gathered from fence line surveys across multiple years indicate that this feature contains at least one active Great Blue Heron nest. Colonially-nesting bird breeding habitats (tree/shrub) with one or more active Great Blue Heron nests are to be considered significant as prescribed by the Draft Ecoregion 7E Criterion Schedule Addendum to the SWHTG (MNR, 2011f). The edge of the colony and a minimum 300 m area of habitat are considered to form the Significant Wildlife Habitat (MNR, 2011e; MNR, 2011f). Because it is not possible to delineate the edge of the colony without access to private property, a 300 m buffer was applied to the ELC polygons in which the colony is located and will be considered to form the Significant Wildlife Habitat, as required by MNR.

Deer Winter Congregation Areas

One feature (DWC-01) was identified as a deer winter congregation area through the Records Review and Site Investigation (refer to Figure 3.6b). Deer management is an MNR responsibility, deer yards are mapped by MNR district offices and, therefore, habitat considered significant will be mapped (MNR, 2011e; MNR, 2011f). Deer winter congregation areas are evaluated by MNR following methods outlined in Selected Wildlife and Habitat Features: Inventory Manual (MNR, 1998). No additional field studies are required to evaluate the significance of this feature. It was carried forward to the EIS phase of this Natural Heritage Assessment.

Specialized Habitats for Wildlife

The following specialized habitats for wildlife were identified as occurring in the Project Study Area and requiring Evaluation of Significance or habitat use studies through the Records Review and Site Investigation:

- Amphibian Breeding Habitats (Woodland); and
- Amphibian Breeding Habitats (Wetland).

A description of the Evaluation of Significance and/or habitat use study methods pertaining to each of these specialized habitats for wildlife follows.

Amphibian Breeding Habitats (Woodland)

AECOM conducted amphibian breeding surveys in order to identify Significant Wildlife Habitat and assess potential impacts of the wind power project on specific natural areas. Amphibian surveys were conducted in April, May, and June 2012. Field notes are provided in Appendix B. These surveys were undertaken by qualified biologists (qualifications of field personnel are provided in Appendix C).

The general locations of amphibian woodland breeding habitats were identified by ELC polygons and a more detailed assessment of habitat conditions was made as follows. The first step was to characterize vernal pools (*i.e.*, temporary pools of water) or permanent ponds in or within the 120 m Area of Investigation, early in the amphibian breeding season. The following characteristics were documented:

- a) UTM;
- b) Maximum water depth;
- c) Presence of emergent and submergent vegetation: type and amount;
- d) Presence of fringing shrubs: type and amount;
- e) Presence of logs (size, quantity) within or near vernal pools;
- f) Apparent water quality (visual observations only);
- g) Disturbance nearby;
- h) Any amphibian observations; and,
- i) Search for salamander or frog egg masses if conditions appear suitable.

Vernal pools that were too shallow, small or degraded to have potential for amphibian breeding (*i.e.*, did not have potential to hold water until at least July in most years) were identified and removed from further study or consideration, as described in the Site Investigation section of this Natural Heritage Assessment (refer to Section 3.3.6.3). Pools that contained sufficient water depth and habitat conditions were investigated further.

Evidence of vernal woodland pools or ponds was observed in or within the 120 m Area of Investigation in a number of natural areas during the 2012 Site Investigations. Eighteen candidate significant features (AWO-02, AWO-03, AWO-04, AWO-06, AWO-07, AWO-08, AWO-09, AWO-14, AWO-17, AWO-24, AWO-25, AWO-26, AWO-27, AWO-28, AWO-30, AWO-33, AWO-34 and AWO-35) are located within 120 m of a proposed access road and have vernal pools or ponds that appeared to be substantial enough during Site Investigations to provide breeding habitat (refer to Figure 3.6d). Spring 2012 surveys were conducted at fourteen of these locations (AWO-03, AWO-04, AWO-06, AWO-07, AWO-08, AWO-09, AWO-14, AWO-17, AWO-24, AWO-25, AWO-26, AWO-27, AWO-28 and AWO-30) and four sites (AWO-02, AWO-33, AWO-34 and AWO-35) will be surveyed in the spring of 2013 as described below. MNR will be consulted if these survey protocols cannot be followed due to property access constraints to determine an appropriate course of action.

Surveys to target vocalizing amphibians (*i.e.*, frogs) were conducted using the following protocol. Each feature was surveyed three times in 2012 between April 1st and June 30th, with at least 15 days between each survey. Monitoring stations were established at the edge of vernal pools or ponds that potentially contained breeding amphibians during vernal pool habitat characterization as described above. Surveys were conducted between one half-hour after sunset and 2:00 am and, to the extent possible, during evenings with little wind and minimum night air temperatures of 5°C (41°F), 10°C (50°F) and 14°C (57°F) for each of the three respective survey periods. An effort was made to conduct the third survey when the minimum night air temperature was 17°C however it is recognized that this may not be possible in all years. To the extent possible, surveys were conducted on nights that were clear, cloudy, damp, foggy, or had light rain. Moderate to heavy rainfall was avoided. After waiting one minute upon arrival at a station to allow for amphibians to start calling again after being disturbed, a 3-minute listening survey was completed at each station. Surveys were conducted using an unlimited distance semi-circular sampling area in which the estimated distance and direction of calling amphibian species was recorded, indicating whether calls are originating from within or beyond the defined 100 m area surveyed. Call counts were recorded using the codes established for the Marsh Monitoring Protocol.

Surveys to target non-vocalizing amphibians (*i.e.*, salamanders) were conducted using at least one of the following three protocols:

1. Adult Salamander Survey

Nocturnal surveys were completed for adult salamanders if the amphibian calling surveys could be done either on, or within two days of a relatively warm rainy night in late March to early April. Adult salamanders will remain in the pond for several days following a warm rain. Headlamps were used to search waters in the pond and a D-ring dipnet was used to scoop sample leaf litter from the bottom of ponds. Ten representative scoops were taken at each site. The litter in each scoop was carefully searched for the presence of salamanders. Any salamanders found were identified, measured and released.

2. Egg Mass Survey

Egg mass surveys for salamanders were conducted in conjunction with vernal pool habitat characterization as described above. Egg mass searches were conducted during daylight hours in early spring with the first visit in March after a relatively warm rain. If eggs were not found on the first survey, a second egg mass survey was conducted in conjunction with the second amphibian call survey in April. Area searches generally included walking within or along the perimeter of the vernal pool/wetland looking for egg masses, carefully checking any submerged sticks or shrubs standing in the water to which eggs may be attached. A minimum search effort of

30 minutes was applied for each station, or a complete check of locations where egg masses may occur, whichever is less. The number of individuals or egg masses of each amphibian species observed was recorded and the life stage (e.g., egg mass or adult) noted.

3. Larval Survey

Larval surveys were conducted in May or June to search for presence of larvae of salamanders. A D-ring dipnet was used to scoop sample leaf litter on the bottom of ponds. Ten representative scoops were taken at each site. The litter in each scoop was placed into a bucket and carefully searched for the presence of salamander larvae. Any larvae found were identified, measured and released. Any other encountered amphibians were recorded and released. Area searches for adult or transformed salamanders were also conducted by overturning logs and walking along the perimeter of the vernal pool or wetland. A minimum search effort of 30 minutes was applied for each station, or a complete check of locations where larvae may occur, whichever is less. Larvae were identified using a field guide or key (e.g., http://www.umesc.usgs.gov/terrestrial/amphibians/mknutson_5003869_field_guide.html). Water depth and other relevant characteristics of the vernal pools were recorded. Logs or debris in the vicinity of the pools were overturned for the presence of salamanders.

Field sheets were prepared to record weather, vernal pool conditions, UTM's, and amphibian observations as well as time and date.

Features containing breeding population of 1 or more of the following species with at least 20 individuals are to be considered significant: Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Chorus Frog, and Wood Frog (MNR, 2011e; MNR, 2011f). The breeding pool or pond and the woodland ELC polygon that either contains or is adjacent to (within 120 m of) the breeding pool or pond will be considered to form the significant wildlife habitat.

Amphibian Breeding Habitats (Wetland)

AECOM conducted amphibian surveys in order to identify Significant Wildlife Habitat and assess potential impacts of the wind power project on specific natural areas. Amphibian surveys were conducted in April, May and June 2012. Field notes are provided in Appendix B. These surveys were undertaken by qualified biologists (qualifications of field personnel are provided in Appendix C).

The first step was to characterize the conditions in open wetlands in or within the 120 m Area of Investigation during the daytime in April 2012, early in the breeding season to determine the extent of potentially suitable standing water. The following characteristics were documented:

- a) UTM;
- b) Maximum water depth;
- c) Presence of emergent and submergent vegetation: type and amount;
- d) Presence of fringing shrubs: type and amount;
- e) Presence of logs (size, quantity) within or near vernal pools;
- f) Apparent water quality (visual observations only);
- g) Disturbance nearby; and
- h) Any amphibian observations.

Ponded areas that were too shallow, small or degraded to be considered to have potential for significant amphibian breeding (i.e., did not have potential to hold water until at least July in most years) were identified and removed from further study or consideration, as described in the Site Investigation section of this Natural Heritage Assessment (refer to Section 3.3.6.3). Pools that contained sufficient water depth and habitat conditions were investigated further.

Evidence of potentially suitable amphibian breeding in open wetlands was observed within the 120 m Area of Investigation during 2012 Site Investigations. One natural feature (AWE-29) was located within 120 m of a proposed access road and appeared to be substantial enough to provide wetland breeding habitat (refer to Figure 3.6c). Surveys to target vocalizing amphibians (*i.e.*, frogs) were conducted using the following protocol. Each feature was surveyed three times in 2012 between April 1st and June 30th, with at least 15 days between each survey. Monitoring stations were established at the edge of vernal pools or ponds that potentially contained breeding amphibians during vernal pool habitat characterization as described above. Surveys were conducted between one half-hour after sunset and 2:00 am and, to the extent possible, during evenings with little wind and minimum night air temperatures of 5°C (41°F), 10°C (50°F) and 14°C (57°F) for each of the three respective survey periods. An effort was made to conduct the third survey when the minimum night air temperature is 17°C however it is recognized that this may not be possible in all years. To the extent possible, surveys were conducted on nights that are clear, cloudy, damp, foggy, or have light rain are suitable. Moderate to heavy rainfall was avoided. After waiting one minute upon arrival at a station to allow for amphibians to start calling again after being disturbed, a 3-minute listening survey was completed at each station. Surveys were conducted using an unlimited distance semi-circular sampling area in which the estimated distance and direction of calling amphibian species was recorded, indicating whether calls are originating from within or beyond the defined 100 m area surveyed. Call counts were recorded using the codes established for the Marsh Monitoring Protocol.

Surveys to target non-vocalizing amphibians (*i.e.*, salamanders) were conducted using at least one of the following three protocols:

1. Adult Salamander Survey

Nocturnal surveys were completed for adult salamanders if the amphibian calling surveys could be done either on, or within two days of a relatively warm rainy night in late March to early April. Adult salamanders will remain in the pond for several days following a warm rain. Headlamps were used to search waters in the pond and a D-ring dipnet was used to scoop sample leaf litter from the bottom of ponds. Ten representative scoops were taken at each site. The litter in each scoop was carefully searched for the presence of salamanders. Any salamanders found were identified, measured and released.

2. Egg Mass Survey

Egg mass surveys for salamanders were conducted in conjunction with vernal pool habitat characterization as described above. Egg mass searches were conducted during daylight hours in early spring with the first visit in March after a relatively warm rain. If eggs were not found on the first survey, a second egg mass survey was conducted in conjunction with the second amphibian call survey in April. Area searches generally included walking within or along the perimeter of the vernal pool/wetland looking for egg masses, carefully checking any submerged sticks or shrubs standing in the water to which eggs may be attached. A minimum search effort of 30 minutes was applied for each station, or a complete check of locations where egg masses may occur, whichever is less. The number of individuals or egg masses of each amphibian species observed was recorded and the life stage (*e.g.*, egg mass or adult) noted.

3. Larval Survey

Larval surveys were conducted in May or June to search for presence of larvae of salamanders. A D-ring dipnet was used to scoop sample leaf litter on the bottom of ponds. Ten representative scoops were taken at each site. The litter in each scoop was placed into a bucket and carefully searched for the presence of salamander larvae. Any larvae found were identified, measured and released. Any other encountered amphibians were recorded and released. Area searches for adult or transformed salamanders were also conducted by overturning logs and walking along the perimeter of the vernal pool or wetland. A minimum search effort of 30 minutes was applied for each station, or a complete check of locations where larvae may

occur, whichever is less. Larvae were identified using a field guide or key (e.g., http://www.umesc.usgs.gov/terrestrial/amphibians/mknutson_5003869_field_guide.html). Water depth and other relevant characteristics of the vernal pools were recorded. Logs or debris in the vicinity of the pools were overturned for the presence of salamanders.

Field sheets were prepared to record weather, vernal pool conditions, UTM's, and amphibian observations as well as time and date.

Features containing breeding population of 1 or more of the following salamander species or two or more of the frog/toad species with at least 20 individuals are to be considered significant: Eastern Newt, Blue-spotted Salamander, Four-toed Salamander, Spotted Salamander, American Toad, Gray Treefrog, Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog or Mink Frog (MNR, 2011e; MNR, 2011f). Any wetland with confirmed breeding by American Bullfrog is to be considered significant. The wetland ELC Ecosite containing the breeding pool or pond and its associated shoreline will be considered to form the Significant Wildlife Habitat.

Habitats of Species of Conservation Concern Identified through the Records Review – Special Concern and Rare Wildlife

Any plant or animal species designated as Special Concern or ranked S1, S2 or S3 and not already recognized as Endangered or Threatened by the Committee on the Status of Species at Risk in Ontario (COSSARO) is Provincially Significant and considered to be a Species of Conservation Concern. The following habitats of Species of Conservation Concern were identified as occurring in the Project Study Area and requiring Evaluation of Significance or habitat use studies through the Records Review and Site Investigation:

- Habitat for Plant Species of Conservation Concern; and
- Red-headed Woodpecker Habitat.

A description of the Evaluation of Significance and/or habitat use study methods pertaining to each of these habitats of Species of Conservation Concern follows.

Habitat of Plant Species of Conservation Concern

Candidate Significant Wildlife Habitats were identified for Burning Bush, Green Dragon, Hairy Bedstraw, Harbinger-of-spring, Pawpaw, Pillose Evening Primrose, Round-leaved Groundsel, Round-leaved Hawthorn and Slim-flowered Muhly within the 120 m Area of Investigation in natural areas 635, 637, 648, 662, 720 and 721 where the transmission line is proposed inside suitable habitats for these species (SCP-01, SCP-02, SCP-03, SCP-04, SCP-05, SCP-06, SCP-07, SCP-08, SCP-09, SCP-10, SCP-11; refer to Figure 3.6a for locations).

Field investigations to identify plant Species of Conservation Concern and their habitats were conducted in conjunction with Ecological Land Classification (ELC) mapping and vascular plant surveys (refer to Section 3.2.1 of this report for a more detailed description of protocols). These surveys were conducted from May 30, 2011 to July 12, 2012. In cases where suitable habitat was identified but the Site Investigation were not conducted during the appropriate time of year when the species are present or easily identifiable, candidate Significant Wildlife Habitat sites were revisited between mid-May and mid-July 2012 to confirm species presence or absence. Taking into consideration all of the plant Species of Conservation Concern and their various blooming periods, this optimal survey period was selected in order to capture the greatest number of species detectable either in flower, fruit or by vegetative characters. GPS co-ordinates and habitat description were recorded in instances where plant Species of Conservation Concern were encountered.

Confirmed Significant Wildlife Habitats for plant Species of Conservation Concern were also identified during 2011 and 2012 Site Investigations, where the following plant Species of Conservation Concern were recorded: Field Thistle, Burning Bush, Cream Violet, Narrow-leaved Sedge and Perfoliate Bellwort (SCP-12, SCP-13, SCP-14, SCP-15, SCP-16 and SCP-17). These features were carried forward to the EIS phase of this Natural Heritage Assessment (refer to Figure 3.6a for locations).

Habitat of Bird Species of Conservation Concern (Red-headed Woodpecker)

Field investigations to identify candidate Significant Wildlife Habitat, including habitat features required for Red-headed Woodpecker, a bird Species of Conservation Concern, were conducted in conjunction with ELC mapping and vascular plant surveys during the 2011 and 2012 field seasons. Forest communities with ELC codes FOD, CUW, and CUT were assessed for habitat features during the Site Investigation of this Natural Heritage Assessment, and five features where tree removal is proposed in association with the transmission line (SCB-01, SCB-02, SCB-03, SCB-04 and SCB-05) were carried forward to the Evaluation of Significance for habitat of bird Species of Conservation Concern (Red-headed Woodpecker) (refer to Sections 3.2.6 and 3.3.6.5).

Breeding bird surveys were conducted in these features according to the Forest Bird Monitoring Protocol, with additions from the Ontario Breeding Bird Atlas Methods.

Woodlands were selected to be surveyed if tree removal was proposed for placement of above-ground infrastructure. Point count stations within the woodland were located within the area of disturbance, and at least 200 m from the forest edge, where forest interior existed. Stations within large woodlands were at least 250 m apart. For woodland areas with no forest interior (less than 200 m from edge), point counts were located in the centre of the forest patch. For woodland features crossing roadways, point counts were located 125 m from the right-of-way on each side of the roadway, allowing 250 m between stations. Locations of point count stations were marked on an aerial map, flagged in the field, and UTM data was recorded.

Three separate surveys were conducted at each station. Surveys were completed between May 24 and July 10, 2012, with at least 10 days between each visit. Surveys were conducted in the morning, between one half hour before dawn and 10 am, when weather conditions were without precipitation and winds were calm. Weather conditions (temperature, sky conditions, wind speed and direction) at each point count were recorded. Refer to Table 4.10 for details.

Each point count was composed of two 5-minute intervals. During each point count all signs and vocalizations of birds were recorded as well as the direction from which the call came. The approximate location of the bird species, breeding activity, and flyovers were recorded on station maps. Surveyors also assessed the distance of the calls, either within a 50 m radius, between 50-100 m or greater than 100 m from the point count location. Habitat within 100 m of the point count station was evaluated using the habitat coding system from the Ontario Nest Records Scheme to provide station-specific habitat information.

Woodland areas identified to contain suitable habitat for bird Species of Conservation Concern, including Red-headed Woodpecker, through the site investigation (SCB-01, SCB-02, SCB-03, SCB-04 and SCB-05) and in respect of which such species were identified utilizing the woodland during the 2012 breeding season were considered Significant Wildlife Habitat and carried forward to the EIS. Entire woodlands were considered to form the Significant Wildlife Habitat features, and are identified as such on Figure 3.6d. Woodlands are the finest classification scale that protects the form and function of Red-Headed Woodpecker habitat given the predominantly agricultural land use in the Project Study Area.

Animal Movement Corridors

The following animal movement corridors were identified as occurring in the Project Study Area and requiring Evaluation of Significance or habitat use studies through the Records Review and Site Investigation:

- Amphibian Movement Corridors; and
- Deer Movement Corridors.

A description of the Evaluation of Significance and/or habitat use study methods pertaining to each of these animal movement corridors follows.

Amphibian Movement Corridors

In order to identify likely amphibian corridors, the significance of Amphibian Woodland Breeding Habitats and Amphibian Wetland Breeding Habitats must first be confirmed in the Evaluation of Significance (MNR, 2011e; MNR, 2011f). Where Significant Wildlife Habitat for breeding amphibians was identified or assumed, the landscape context was evaluated to identify potential or likely movement corridors based on configuration of naturally vegetated areas and breeding sites. The location of probable corridors was examined to determine if they occur within 120 m of a project component.

The significance of amphibian movement corridors was determined based on the significance of the amphibian breeding habitats they are associated with: an amphibian movement corridor was assumed to be significant if any of the amphibian breeding habitats it is associated with are confirmed to be significant based on Evaluation of Significance surveys as described above or treated as significant for the purpose of this submission.

Deer Movement Corridors

One woodland feature (WOD-331) was identified as a candidate Deer Movement Corridor through the Site Investigation (refer to Figure 3.6b for locations). Conventional White-tailed Deer survey techniques such as aerial counts, snow-tracking, and pellet group counts (Konze and McLaren, 1997) are not applicable because they are generally used to estimate deer population which is not the aim for this study. Furthermore, these survey techniques are most effective during the winter period due to increased visibility as result of snow cover; however, deer congregate during the winter and as such these survey techniques fail to capture the deer fall migration and spring dispersion to and from Deer Winter Congregation Areas. At the same time, appropriate methods that are typically used to track deer movement utilize GPS radio collars and trail cameras which are not feasible for the present study. For these reasons, there are no practical field studies to evaluate the significance of this feature. As a result, WOD-331 was assumed to be a significant deer movement corridor and carried forward to the EIS phase of this NHA.

4.3 Results of Evaluation of Significance

The following sections summarize the Evaluation of Significance results for all natural features carried forward from the Records Review and Site Investigation.

4.3.1 Wetlands

Provincially Significant Wetlands (PSWs) are those areas identified through completion of an OWES evaluation as being the most valuable within the landscape. Locally Significant Wetlands are those areas identified through completion of an OWES evaluation as not meeting the requirements for Provincial Significance; these may play an important role in the local landscape. Unevaluated wetlands within 120 m of Project components were treated as

Provincially Significant without undertaking a full OWES if they were located outside the Project Location, and an EIS was completed as described in Section 5 of this report. A total of 14 wetland complexes occur in or within the 120 m Area of Investigation identified during site investigations, all of which were treated as Provincially Significant and assessed according to the characteristics/ecological functions described in Appendix C of the Natural Heritage Assessment Guide (MNR, 2011a). A detailed description of each wetland complex and its associated characteristics is described in Table 4.3 below. The locations of these wetlands (WET-006, WET-008, WET-009, WET-010, WET-011, WET-012, WET-014, WET-019, WET-021, WET-025, WET-033, WET-038, WET-049 and WET -053) are shown on Figure 3.3.

By applying complexing rules, five evaluated wetlands form a portion of three different wetland complexes. The Provincially Significant Hay Swamp and Provincially Significant McDonald Marsh Wetland form a portion of WET-012, Locally Significant Keller Swamp and Locally Significant Datars-Miller Swamp form a portion of WET-032, and Locally Significant O'Brien Swamp forms a portion of WET-010. Although the existing boundaries of these evaluated wetlands are not within 120 m of the proposed Project, these three wetland complexes are partially located within the 120 m Area of Investigation (Figure 3.3); therefore the five evaluated wetlands are components of three wetland features in or within the 120 m Area of Investigation. These new portions of the wetlands occurring within 120 m of the Project Location are not described in the original OWES evaluations, therefore information has been provided here to allow for these features to be appropriately addressed in the EIS.

All wetlands assessed are considered riverine and/or palustrine, and are comprised of swamp with some associated marsh communities. The marsh communities are typically found along stream systems whereas the swamp communities are found both along stream systems and isolated amongst agricultural fields.

Table 4.3 presents the 14 wetland complexes that were treated as Provincially Significant and carried forward to the EIS.

Table 4.3 Wetland Characteristics and Ecological Functions Assessment

Wetland # (refer to Figure 3.3)	Natural Area(s)	Distance from Project Location	Biological Component							Hydrological Component					Special Features Component			
			Wetland Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to Other Wetlands	Inter- spersion	Open Water Type	Flood Attenuation	Water Quality Improvement			Shoreline Erosion Control	Groundwater Recharge	Species Rarity	Significant Features and Habitats	Fish Habitat
											Short Term	Long Term Nutrient Trap	Groundwater Discharge					
WET-006	177, 178, 180	>0.1 m (access road)	25.0	Swamp	Palustrine Riverine	S1 (FOD7-2): <i>h*</i> , green ash; ² Freeman's maple, white elm, <i>ts</i> , American prickly ash; nannyberry, common buckthorn, and currant species.	Approximately 46 m	47	Type 1	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 186.0 ha; No known upstream detention areas within catchment basin. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 13%; Seeps: None; Not located within 1 km of a major aquifer. 	Trees and shrubs	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Present (Swamp) Not Significant
WET-008	192, 215	38 m (collection line)	6.6	Swamp	Palustrine	S³1 (SWD3-3): <i>h*</i> , Freeman's maple; green ash, <i>gc</i> , sensitive fern, false nettle, lady fern, woodland strawberry, northern dewberry, <i>ne</i> , fowl manna grass ; bladder sedge.	Approximately 1974 m	35	Type 1	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 9.6 ha; No known upstream detention areas within catchment basin. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 69%; Seeps: None; Not located within 1 km of a major aquifer. 	n/a	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Absent
WET-009	200, 217	100 m (collection line)	3.3	Swamp	Palustrine	S1 (FOD7-2): <i>h*</i> , green ash; white elm, ironwood and basswood <i>ts</i> , hawthorn species; red maple, white elm. S2 (SWD3-1): <i>h*</i> , red maple; white elm, green ash, cottonwood, <i>ne</i> , sedge species.	Approximately 309 m	17	Type 1	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 14.1 ha; No known upstream detention areas within catchment basin. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 23%; Seeps: None; Not located within 1 km of a major aquifer. 	n/a	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Absent
WET-010 • O'Brien Swamp LSW	185, 187, 188, 191, 194, 195, 196, 203, 209, 225, 236, 241	3 m (collection line)	78.6	Swamp Marsh	palustrine riverine	S1 (SWD2-2): <i>h*</i> , green ash; Freeman's maple, shagbark hickory, <i>ts</i> , white elm; basswood. S2 (SWD3-3): , <i>h*</i> , Freeman's maple; shagbark hickory, <i>ts</i> , white elm, Freeman's maple; green ash, <i>ne</i> , hop sedge, fowl manna grass, rice-cut grass, dwarf raspberry. S3 (SWD2-2): <i>h*</i> , green ash; <i>ne</i> , reed canary grass. S4 (SWT2): <i>ts*</i> , spicebush. S5 (SWD3-3): <i>h*</i> , Freeman's maple; shagbark hickory, black ash, <i>ts</i> , Freeman's maple; white elm. W⁴1 (SAS1-3): <i>su*</i> , stonewort. M⁵1(MAM2-2): <i>ne*</i> reed canary grass. These wetland communities have been complexed with the Locally Significant O'Brien Swamp Wetland. Detailed information regarding the biological, hydrological and special features of this wetland are available in the OWES evaluation for this wetland which is on file with the MNR.	Approximately 646 m	91	Type 3	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 275.1 ha; No known upstream detention areas within catchment basin. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 29%; Seeps: None; Not located within 1 km of a major aquifer. 	n/a	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: sands, loams, gravels. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Habitat suitable for waterfowl breeding. Locally significant winter cover for wildlife. 	Present (Swamp) Not Significant
WET-011	213, 221, 230, 235, 245	>0.1 m (access road)	18.6	Swamp	Palustrine Riverine	S1 (SWD3-3/SWD4a): <i>h*</i> , Freeman's maple; green ash. S2 (FOD7-2): <i>h*</i> , green ash; white elm, bur oak, basswood, <i>ts</i> , white elm; basswood, sugar maple, <i>gc</i> , tall white aster, running strawberry bush, herb-robert, <i>ne</i> , graceful sedge. S3 (SWD3-3): <i>h*</i> , Freeman's maple, green ash, <i>ts</i> , Freeman's maple, white elm.	Approximately 157 m	33	Type 1	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 114.3 ha; No known upstream detention areas within catchment basin. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 16%; Seeps: None; Not located within 1 km of a major aquifer. 	Trees and shrubs	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Present (Swamp) Not Significant

Wetland # (refer to Figure 3.3)	Natural Area(s)	Distance from Project Location	Biological Component							Hydrological Component					Special Features Component			
			Wetland Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to Other Wetlands	Inter- spersion	Open Water Type	Flood Attenuation	Water Quality Improvement			Shoreline Erosion Control	Groundwater Recharge	Species Rarity	Significant Features and Habitats	Fish Habitat
											Short Term	Long Term Nutrient Trap	Groundwater Discharge					
WET-012 • Hay Swamp PSW • MacDonald Wetland PSW	321, 325, 347, 348, 350, 379, 381, 385, 393, 395, 404, 413, 416, 420, 421, 422, 424, 604, 605, 607, 609, 614, 616, 624, 626, 627, 632, 633	>0.1 m (transmission line)	238.8	Swamp	Riverine Palustrine	S1 (SWD3-3): <i>h*</i> , Freeman's maple; white elm, gc , sensitive fern, ne , sedge species. S2 (SWD2-2): <i>h*</i> , green ash. S3 (SWD2-2): <i>h*</i> , green ash; Freeman's maple, gc , wood nettle spotted-touch me not, goldenrod species, iris species. S4 (SWT2-2): <i>ts*</i> , sandbar willow; alternate-leaved dogwood, red-osier dogwood, ne , reed canary grass, gc , wood nettle, spotted-touch me not, goldenrod species. M1 (MAM2-2): ne* , reed canary grass, sedge species, spotted-touch-me-not, garlic mustard. These wetland communities have been complexed with the Hay Swamp and MacDonald Wetland Provincially Significant Wetlands. Detailed information regarding the biological, hydrological and special features of this wetland are available in the OWES evaluation for this wetland which is on file with the MNR.	Approximately 321 m	107	Type 3	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 33,865.2 ha; Total area of known upstream detention area 58.2 ha. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 1%; Seeps: None; Located within 1 km of a major aquifer. 	Trees and shrubs	<ul style="list-style-type: none"> Dominant Wetland Type: riverine; Surrounding Soils: sands, loams, gravels. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Habitat suitable for waterfowl breeding. Winter cover for wildlife significant in site region. 	Present (Swamp/ High Marsh) Locally Significant
WET-014	179, 181, 183, 184, 189, 193, 198, 201, 204, 208, 210, 211, 212, 216, 219, 227, 232, 233, 234, 239, 243, 253, 254, 255, 256, 258, 268, 276, 286	>0.1 m (collection line)	204.5	Swamp	Palustrine Riverine	S1 (FOD7-1): <i>h*</i> , freeman's maple, white elm, white ash, black walnut, ts , white ash, hawthorne sp., prickly ash, ls , black raspberry, prickly ash, gc , garlic mustard, wood nettle, poison ivy, thicket creeper, yellow avens S2 (FOD7-2): <i>h*</i> , green ash; Manitoba maple, white elm, ts , green ash; Manitoba maple, hawthorn species. S3 (FOD7-2): <i>h*</i> , green ash; white ash, ts , green ash; pin cherry, staghorn sumac, alternate-leaved dogwood, ls , grey dogwoog, gc , giant ragweed; Canada goldenrod. S4 (SWD2-2): <i>h*</i> , green ash; white elm, shagbark hickory, bitternut hickory, ts , white elm; bitternut hickory, green ash, gc , moneywort, poison ivy. S5 (FOD7-2): <i>h*</i> , green ash; basswood, white elm, ts , sugar maple; blue beech, multiflora rose, grey dogwood, gc , white avens; herb-robert, running strawberry bush, Virginia strawberry, ne , graceful sedge. S6 (SWD3-3): <i>h*</i> , Freeman's maple; green ash, ts , red-osier dogwood; choke cherry, buckthorn, ne , long-stalked sedge. S7 (SWD2-2): <i>h*</i> , green ash. S8 (SWD3-3): <i>h*</i> , Freeman's maple. S9 (FOD7-2): <i>h*</i> , green ash; Manitoba maple, white elm, ts , hawthorn species, green ash, Manitoba maple, gc , common dandelion, garlic mustard, Manitoba maple, wild strawberry.	Directly adjacent	146	Type 3	<ul style="list-style-type: none"> Located in the lower and mid-reach portions of the watershed; Catchment basin upstream of wetland 36,783.0 ha; Total area of known upstream detention area 393.1 ha. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 1%; Seeps: None; Not located within 1 km of a major aquifer. 	Emergent vegetation	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Currently nesting colonial waterbirds (Great Blue Heron). Locally significant winter cover for wildlife. 	Present (Swamp/ High Marsh) Not Significant
WET-019	266, 280, 285, 287, 295, 305	>0.1 m (collection line)	56.3	Swamp	Palustrine Riverine	S1 (SWT2a): <i>ts*</i> , Russian olive; sandbar willow, gray dogwood, ts , green ash, Freeman's maple, ne , reed canary grass; sedge species. S2 (SWD3-3): <i>h*</i> , Freeman's maple; green ash, paper birch, black ash, ts , spicebush, white elm, gc , wild lily-of-the-valley; sensitive fern. S3 (FOD7-2): <i>h*</i> , green ash; cottonwood, Freeman's maple, ts , white ash; nannyberry, spicebush, gc , white avens; black currant. S4 (SWD4b): <i>h*</i> , green ash, trembling aspen, blue beech, white elm, ts , spicebush. S5 (FOD7-2): <i>h*</i> , green ash; white elm, trembling aspen, ts , spicebush, green ash, gc , thicket creeper; enchanter's nightshade, black raspberry, white avens. S6 (SWD4c): <i>h*</i> , cottonwood. S7 (SWD2-2): <i>h*</i> , green ash; Freeman's maple, white elm, ts , spicebush; green ash.	Approximately 2185 m	69	Type 3	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 1,209.2 ha; Total area of known upstream detention area 8.9 ha. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 5%; Seeps: None; Not located within 1 km of a major aquifer. 	Trees and shrubs	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: sands, loams, gravels. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Present (Swamp) Not Significant

Wetland # (refer to Figure 3.3)	Natural Area(s)	Distance from Project Location	Biological Component							Hydrological Component					Special Features Component			
			Wetland Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to Other Wetlands	Inter- spersion	Open Water Type	Flood Attenuation	Water Quality Improvement			Shoreline Erosion Control	Groundwater Recharge	Species Rarity	Significant Features and Habitats	Fish Habitat
											Short Term	Long Term Nutrient Trap	Groundwater Discharge					
WET-021	262, 265, 270, 273, 274, 279, 291, 298, 300, 309, 317, 318, 754, 756	>0.1 m (collection line)	117.4	Marsh Swamp	Palustrine Riverine	S1 (SWD6-3): <i>h*</i> , Freeman's maple; green ash, white elm, Manitoba maple, cottonwood. S2 (SWD4a): <i>h*</i> , Freeman's maple, green ash; <i>ts</i> , white elm, green ash, Freeman's maple, <i>gc</i> , tall white aster, <i>ne</i> , sedge species, fowl manna grass. S3 (SWD3-3): <i>h*</i> , Freeman's maple; white elm. S4 (FOD7-2): <i>h*</i> , green ash; basswood, <i>ts</i> , white elm, spicebush, <i>gc</i> , wild strawberry; white avens. S5 (SWD3-3): <i>h*</i> , Freeman's maple; green ash, <i>gc</i> , black nightshade, pale smartweed, <i>ne</i> , sedge species. S6 (SWD3-3): <i>h*</i> , Freeman's maple; black walnut, white ash, white elm, <i>gc</i> , spotted jewelweed; garlic mustard, stinging nettle, tall meadow rue, running strawberry bush. S7 (SWT2b): <i>ts*</i> , gray dogwood, red-osier dogwood; sandbar willow, <i>gc</i> , common dandelion, garlic mustard; an avens species, Virginia strawberry. S8 (SWD4-1): <i>h*</i> , hybrid crack willow. S9 (SWD3-3): <i>h*</i> Freeman's maple, cottonwood, trembling aspen. M1 (MAM3-2): <i>ne*</i> , reed canary grass, <i>gc</i> , goldenrod species, aster species.	Approximately 895 m	78	Type 3	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 2,070.4 ha; Total area of known upstream detention area 23.0 ha. 	Surrounding land us is over 50% agricultural.	Swamp with more than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 6%; Seeps: None; Not located within 1 km of a major aquifer. 	Trees and shrubs	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Present (Swamp) Not Significant
WET-025	375, 392	16 m (access road)	5.3	Marsh Swamp	Palustrine	S1 (SWD3-3): <i>h*</i> , Freeman's maple, green ash, <i>ts</i> , Freeman's maple, white elm, basswood. S2 (SWD3-3): <i>h*</i> , Freeman's maple; green ash, <i>ts</i> , Freeman's maple, green ash, poison ivy, <i>gc</i> , red-osier dogwood; poison ivy, sensitive fern. S3: (SWD3-3): <i>h*</i> Freeman's maple, willow species; green ash. M1 (MAM2a): <i>re*</i> , common reed grass; cattail, <i>ne</i> , reed canary grass, <i>gc</i> , paniced aster, path rush, marsh fern, northern water-horehound, meadow horsetail.	Approximately 465 m	34	Type 1	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 20.3 ha; No known upstream detention areas within catchment basin. 	Surrounding land us is over 50% agricultural.	Marsh with less than 50% covered with organic soil.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 26%; Seeps: None; Not located within 1 km of a major aquifer. 	n/a	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Absent
WET-032 • Datar's-Miller Swamp LSW Wetland • Keller Swamp LSW	244, 249, 259, 267, 282, 283, 286, 292, 296, 301, 307, 311, 315, 320, 322, 327, 333, 338, 340, 351, 353, 354, 359, 368, 374, 380, 382, 384, 387, 388, 397, 602, 603	>0.1 m (collection line)	549.8	Swamp	Palustrine Riverine	S1 (SWD2-2): <i>h*</i> , green ash; white elm, <i>ne</i> , reed canary grass. S2 (FOD7-2): <i>h*</i> , green ash; trembling aspen, <i>ts</i> , green ash, hawthorn species, <i>gc</i> , enchanter's nightshade, tall white aster. S3 (SWD2-2): <i>h*</i> , green ash; shagbark hickory. <i>ts</i> , green ash, white elm, <i>gc</i> , paniced aster, <i>ne</i> , fowl manna grass, sedge species. S3 (FOD7-2): <i>h*</i> , green ash; white elm, bur oak, shagbark hickory, <i>ts</i> , white elm; sugar maple, <i>gc</i> , garlic mustard; white avens, herb-robert, giant goldenrod. S4 (SWD2-2): <i>h*</i> , green ash; Freeman's maple. S5 (SWD4a): <i>h*</i> freeman's maple, green ash; white elm, <i>ts</i> , white elm, <i>ne</i> , sedge species, fowl manna grass, <i>gc</i> , tall white aster. These wetland communities have been complexed with the Datar's-Miller Swamp and Keller Swamp Locally Significant Wetlands. Detailed information regarding the biological, hydrological and special features of this wetland are available in the OWES evaluation for this wetland which is on file with the MNR.	Approximately 73 m	108	Type 1	<ul style="list-style-type: none"> Located in the lower portion of the watershed; Catchment basin upstream of wetland 9,368.5 ha; Total area of known upstream detention area 78.6 ha. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 6%; Seeps: None; Not located within 1 km of a major aquifer. 	Trees and shrubs	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: sands, loams, gravels. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Winter cover for wildlife significant in site region. 	Present (Swamp) Locally Significant
WET-038	700, 701	114 m (transmission line)	4.2	Swamp	Palustrine	S1 (SWD3-3): <i>h*</i> , Freeman's maple; green ash, <i>ts</i> , Freeman's maple, green ash, <i>ts</i> , white elm; blue beech, black ash, <i>gc</i> , white avens; spotted geranium, false solomon's seal.	Approximately 1288 m	45	Type 1	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 100.4 ha; No known upstream detention areas within catchment basin. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 4%; Seeps; Not located within 1 km of a major aquifer. 	n/a	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Absent

Wetland # (refer to Figure 3.3)	Natural Area(s)	Distance from Project Location	Biological Component							Hydrological Component					Special Features Component			
			Wetland Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to Other Wetlands	Inter- spersion	Open Water Type	Flood Attenuation	Water Quality Improvement			Shoreline Erosion Control	Groundwater Recharge	Species Rarity	Significant Features and Habitats	Fish Habitat
											Short Term	Long Term Nutrient Trap	Groundwater Discharge					
WET-049	364, 757	13 m (turbine construction footprint)	26.2	Swamp	Palustrine	S1 (SWD2-2): <i>h*</i> : green ash; basswood, <i>ts</i> , spicebush; green ash.	Approximately 1369 m	68	Type 2	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 72.3 ha; No known upstream detention areas within catchment basin. 	Surrounding land us is over 50% agricultural.	Swamp with less than 50% covered with organic soils.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 36%; Seeps: None; Located within 1 km of a major aquifer. 	n/a	<ul style="list-style-type: none"> Dominant Wetland Type: palustrine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Absent
WET-053	738, 739, 740, 741, 742, 750	>0.1 m (transmission line)	20.3	Swamp Marsh	Riverine	S1 (SWD4-1): <i>h*</i> , hybrid crack willow, <i>ts</i> , alternate-leaved dogwood, <i>ne</i> , reed-canary grass, <i>gc</i> , spotted jewelweed. M1 (MAM2-2): <i>ne*</i> , reed canary grass.	Approximately 73 m	44	Type 1	<ul style="list-style-type: none"> Located in the headwaters of the watershed; Catchment basin upstream of wetland 3,003.5 ha; Total area of known upstream detention area 8.3 ha. 	Surrounding land us is over 50% agricultural.	Marsh with less than 50% covered with organic soil.	<ul style="list-style-type: none"> Topography: flat/rolling; Wetland to catchment area ratio: 1%; Seeps: None; Not located within 1 km of a major aquifer. 	Emergent vegetation	<ul style="list-style-type: none"> Dominant Wetland Type: riverine; Surrounding Soils: clays. 	No provincially significant, regionally significant or locally significant species encountered	<ul style="list-style-type: none"> Locally significant winter cover for wildlife. 	Present (High Marsh) Not Significant

- Notes:
1. Denotes dominant form within community
 2. Denotes dominant species within each form by the use of a semi colon between species names
 3. S: Refers to swamp communities
 4. W: Refers to aquatic communities
 5. M: Refers to marsh communities

4.3.2 Woodlands

An assessment of each woodland in or within the 120 m Area of Investigation was undertaken based on the criteria and standards described in the Natural Heritage Assessment Guide. As described therein, woodlands meeting any one of the evaluation criteria are to be considered significant provided they meet minimum width requirements (e.g., average minimum width of 40 m measured to crown edges where the size criterion threshold is 0.5 to 4 ha). The results of the woodlands evaluation are documented in Table 4.4.

A total of 75 woodlands occurring in or within the 120 m Area of Investigation were evaluated following the criteria described within Section 4.2.2 above (refer to Figure 3.4 for the locations of woodland features). Of these, 65 woodlands are considered significant based on meeting at least one of the criteria used in the evaluation process and minimum width requirements. These woodlands were therefore carried forward to the EIS. Details regarding the specific criteria/criterion met by each woodland feature are provided in Table 4.4.

Table 4.4 Determination of Significance for Woodlands

Woodland Feature ID	Natural Area #	Municipality	Evaluation Criteria and Standards (Based on 16.5% woodland cover within the Municipality of Bluewater and 9.4% cover within the Municipality of South Huron)													# of Criteria Met to Date	Determination of Significance	
			1. Woodland Size		2.a) Woodland Interior		2.b) Proximity to Other Significant Woodlands/Habitats		2.c) Linkages		2.d) Water Protection		2.e) Woodland Diversity Representation (composition)		3. Uncommon Characteristics			
			Must be at least		Must have woodland interior (at least 100 m from edge) at least ¹		Must be within 30 m of a significant natural feature or fish habitat ² and be at least		Must be located between 2 other significant features, each of which is within 120 m, and be at least		Must be located within 50 m of a sensitive groundwater discharge ³ , recharge, headwater area, watercourse or fish habitat and be at least		Must be dominated singly or in combination by native naturally occurring Ms, Mb, Msi, Mr, By, H, Ba, Ab, Wb, Ta, Sp, Pi, Oa, Ba, He, and be at least		Must have rare vegetation community (S1, S2 or S3) and be more than 0.5 ha in size OR Habitat of a rare, uncommon, or restricted woodland plant species with 10 individual stems or 100 m of leaf coverage and be more than 0.5 ha in size OR Characteristics of older woodlands or woodlands with larger tree size structure in native species and be more than			
			Municipality of Bluewater: 20 ha in size		Municipality of Bluewater: 2 ha in size		Municipality of Bluewater: 4 ha in size		Municipality of Bluewater: 4 ha in size		Municipality of Bluewater: 2 ha in size		Municipality of Bluewater: 4 ha in size		Municipality of Bluewater: 2 ha in size			
			Municipality of South Huron: 4 ha in size		Municipality of South Huron: Any size		Municipality of South Huron: 1 ha in size		Municipality of South Huron: 1 ha in size		Municipality of South Huron: 0.5 ha in size		Municipality of South Huron: 1 ha in size		Municipality of South Huron: 1 ha in size			
Criteria Met		Criteria Met		Criteria Met		Criteria Met		Criteria Met		Criteria Met		Criteria Met						
Y/N	Description	Y/N	Description	Y/N	Description	Y/N	Description	Y/N	Description	Y/N	Description	Y/N	Description					
WOD-001	177	South Huron	Y	17.4 ha	Y	1.1 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	4	Significant
WOD-012	189	South Huron	Y	63.4 ha	Y	22.8 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Dominated by listed species	N	Does not meet criteria	5	Significant
WOD-018	198	South Huron	Y	7.1 ha	N	0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	3	Significant
WOD-023	203	South Huron	Y	39.9 ha	Y	7.5 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Dominated by listed species	N	Does not meet criteria	4	Significant
WOD-026	206	South Huron	Y	11.2 ha	N	0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	3	Significant
WOD-028	209	South Huron	Y	12.6 ha	Y	0.7 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Dominated by listed species	N	Does not meet criteria	5	Significant
WOD-032	190/210	South Huron	Y	46.9 ha	Y	2.1 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-033	215	South Huron	Y	12.5 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Not within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-034	216	South Huron	Y	25.0 ha	Y	2.6 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-035	217	South Huron	N	1.3 ha	N	0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Not dominated by listed species	N	Does not meet criteria	0	Not Significant
WOD-042	225	South Huron	N	3.5 ha	N	0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	0	Not Significant
WOD-044	236	South Huron	N	0.4 ha	N	0 ha	N	Does not meet size requirement	N	Does not meet criteria	N	Does not meet criteria	N	Not dominated by listed species	N	Does not meet criteria	0	Not Significant
WOD-047	229	South Huron	Y	4.3 ha	N	0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-049	232	South Huron	Y	118.0 ha	Y	39.8 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-053	235	South Huron	N	1.6 ha	N	0.0 ha	Y	Within 30 m of a significant natural feature	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	1	Significant
WOD-054	236	South Huron	Y	28.4 ha	Y	0.2 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-056	240	South Huron	N	0.7 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	0	Not Significant
WOD-060	242	South Huron	N	3.5 ha	N	0.0 ha	N	Does not meet size requirement	N	Does not meet criteria	N	Does not meet criteria	Y	Dominated by listed species	N	Does not meet criteria	1	Significant
WOD-063	244	South Huron	Y	8.7 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-064	245	South Huron	Y	6.9 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	4	Significant
WOD-068	249	South Huron	Y	7.8 ha	N	0.1 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	3	Significant
WOD-070	250	South Huron	Y	10.3 ha	Y	0.1 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-076	251	South Huron	N	2.0 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	1	Significant
WOD-087	259	South Huron	Y	19.6 ha	Y	3.4 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	3	Significant
WOD-093	261	South Huron	Y	9.5 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-101	267	South Huron	Y	5.1 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	3	Significant
WOD-103	269	South Huron	N	3.7 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	1	Significant
WOD-104	609	South Huron	N	1.0 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	2	Significant
WOD-106	271	South Huron	Y	6.2 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	4	Significant
WOD-109	609	South Huron	Y	45.1 ha	Y	22.8 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	4	Significant
WOD-112	637	South Huron	N	1.1 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	2	Significant
WOD-113	611	South Huron	Y	4.5 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	4	Significant
WOD-114	273	South Huron	N	0.9 ha	N	0.0 ha	N	Does not meet size requirement	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Does not meet size requirement	N	Does not meet criteria	1	Significant
WOD-117	255/258	South Huron	Y	455.3 ha	Y	249.8 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-118	275	South Huron	Y	8.1 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-120	648	South Huron	N	2.8 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	3	Significant
WOD-129	279/274	South Huron	Y	8.8 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	3	Significant
WOD-130	701	South Huron	Y	14.4 ha	Y	2.2 ha	Y	Within 30 m of a significant natural feature	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	4	Significant
WOD-131	266/280	South Huron	Y	199.8 ha	Y	122.4 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-133	282	South Huron	Y	20.6 ha	Y	0.6 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-134	662	South Huron	Y	4.4 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-135	661	South Huron	N	1.5 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-136	695	South Huron	Y	5.4 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	3	Significant
WOD-137	285	South Huron	Y	5.8 ha	Y	0.1 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Not dominated by listed species	N	Does not meet criteria	2	Significant
WOD-145	702	South Huron	Y	8.9 ha	Y	0.000147 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-146	290	South Huron	N	3.5 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-149	291	South Huron	N	3.8 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	3	Significant
WOD-154	723	South Huron	Y	18.6 ha	Y	1.3 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	5	Significant
WOD-158	300	South Huron	Y	46.7 ha	Y	8.8 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse and a recharge area	N	Not dominated by listed species	N	Does not meet criteria	4	Significant
WOD-164	722	South Huron	N	0.7 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	0	Not Significant
WOD-176	300	South Huron	Y	5.6 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a recharge area	N	Not dominated by listed species	N	Does not meet criteria	3	Significant
WOD-180	721	South Huron	Y	4.8 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant
WOD-191	309	South Huron	Y	8.7 ha	Y	0.3 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse and a recharge area	Y	Some areas dominated by listed species	N	Does not meet criteria	4	Significant

Evaluation Criteria and Standards																		# of Criteria Met to Date	Determination of Significance
(Based on 16.5% woodland cover within the Municipality of Bluewater and 9.4% cover within the Municipality of South Huron)																			
1. Woodland Size	2.a) Woodland Interior		2.b) Proximity to Other Significant Woodlands/Habitats		2.c) Linkages		2.d) Water Protection		2.e) Woodland Diversity Representation (composition)		3. Uncommon Characteristics								
Must be at least	Must have woodland interior (at least 100 m from edge) at least ¹		Must be within 30 m of a significant natural feature or fish habitat ² and be at least		Must be located between 2 other significant features, each of which is within 120 m, and be at least		Must be located within 50 m of a sensitive groundwater discharge ³ , recharge, headwater area, watercourse or fish habitat and be at least		Must be dominated singly or in combination by native naturally occurring Ms, Mb, Msi, Mr, By, H, Ba, Ab, Wb, Ta, Sp, Pi, Oa, Ba, He, and be at least		Must have rare vegetation community (S1, S2 or S3) and be more than 0.5 ha in size OR Habitat of a rare, uncommon, or restricted woodland plant species with 10 individual stems or 100 m of leaf coverage and be more than 0.5 ha in size OR Characteristics of older woodlands or woodlands with larger tree size structure in native species and be more than								
Municipality of Bluewater: 20 ha in size	Municipality of Bluewater: 2 ha in size		Municipality of Bluewater: 4 ha in size		Municipality of Bluewater: 4 ha in size		Municipality of Bluewater: 2 ha in size		Municipality of Bluewater: 4 ha in size		Municipality of Bluewater: 2 ha in size								
Municipality of South Huron: 4 ha in size	Municipality of South Huron: Any size		Municipality of South Huron: 1 ha in size		Municipality of South Huron: 1 ha in size		Municipality of South Huron: 0.5 ha in size		Municipality of South Huron: 1 ha in size		Municipality of South Huron: 1 ha in size								
Criteria Met		Criteria Met		Criteria Met		Criteria Met		Criteria Met		Criteria Met		Criteria Met							
Y/N	Description	Y/N	Description	Y/N	Description	Y/N	Description	Y/N	Description	Y/N	Description	Y/N	Description						
WOD-200	720	South Huron	N	2.3 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant	
WOD-210	738	South Huron	N	3.2 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	3	Significant	
WOD-227	321	South Huron	Y	4.4 ha	Y	0.0029 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a recharge area	Y	Some areas dominated by listed species	N	Does not meet criteria	4	Significant	
WOD-231	759	South Huron	N	0.6 ha	N	0.0 ha	N	Does not meet size criteria	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Does not meet size requirement	N	Does not meet criteria	1	Significant	
WOD-251	326/331	Bluewater	N	14.3 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse and a recharge area	Y	Some areas dominated by listed species	N	Does not meet criteria	3	Significant	
WOD-278	339/342	Bluewater	N	15.8 ha	N	0.8 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a recharge area	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant	
WOD-286	349/346	Bluewater	N	3.5 ha	N	0.0 ha	N	Does not meet size requirement	N	Does not meet criteria	Y	Within 50 m of a watercourse and a recharge area	N	Does not meet size requirement	N	Does not meet criteria	1	Significant	
WOD-289	352	Bluewater	N	7.2 ha	N	0.0 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse and a recharge area	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant	
WOD-295	358	Bluewater	N	4.1 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a recharge area	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant	
WOD-299	362	Bluewater	N	2.0 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	0	Not Significant	
WOD-300	757	Bluewater	N	11.7 ha	N	0.3 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a watercourse	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant	
WOD-301	361	Bluewater	N	2.5 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a recharge area	N	Does not meet size requirement	N	Does not meet criteria	1	Significant	
WOD-303	364	Bluewater	N	9.6 ha	N	0.016 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	1	Significant	
WOD-306	369	Bluewater	N	13.7 ha	N	0.6 ha	Y	Within 30 m of fish habitat	N	Does not meet criteria	Y	Within 50 m of a watercourse	N	Not dominated by listed species	N	Does not meet criteria	2	Significant	
WOD-307	370	Bluewater	N	1.4 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	0	Not Significant	
WOD-309	372	Bluewater	N	4.0 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a recharge area	Y	Some areas dominated by listed species	N	Does not meet criteria	2	Significant	
WOD-310	375	Bluewater	N	3.0 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	0	Not Significant	
WOD-311	373	Bluewater	N	0.9 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	0	Not Significant	
WOD-312	375	Bluewater	N	2.1 ha	N	0.0 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet size requirement	N	Does not meet criteria	0	Not Significant	
WOD-313	375	Bluewater	N	13.2 ha	N	0.5 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	1	Significant	
WOD-328	392	Bluewater	N	9.7 ha	N	0.1 ha	N	Does not meet criteria	N	Does not meet criteria	N	Does not meet criteria	Y	Some areas dominated by listed species	N	Does not meet criteria	1	Significant	
WOD-331	379	Bluewater	Y	1,992.9 ha	Y	1257.9 ha	N	Does not meet criteria	N	Does not meet criteria	Y	Within 50 m of a watercourse, Within 30 m of fish habitat	Y	Some areas dominated by listed species	N	Does not meet criteria	4	Significant	

Notes: 1. Area of Interior Forest for each woodland feature is not necessarily contiguous. I.e. pockets of interior forest within a single woodland may be isolated from one another.
2. The numbers in parentheses indicate watercourse numbers referred to in the Water Assessment and Water Body Report.
3. Groundwater indicator species observed during field investigations were used to determine presence/absence of groundwater discharge areas.

4.3.3 Valleylands

One valleyland feature was identified through the Site Investigation and Records Review. The location of this valleyland is shown on Figure 3.5. Following the evaluation criteria as outlined within the Natural Heritage Assessment Guide, VAL-02 was evaluated as significant considering that it satisfied the following criteria: landform prominence, surface water functions, high degree of naturalness, community and species diversity and linkage (Table 4.5). This valleyland was therefore carried forward to the EIS.

Table 4.5 Determination of Significance for Valleylands

Valleyland Feature #	Distance from Project Location	Landform-Related Functions	Ecological Features		Restored Ecological Functions	Determination of Significance
			Degree of Naturalness	Linkage Function		
VAL-02	0 (transmission line in feature)	The total catchment area of the surface water feature through the valleyland is 32,249 ha. Associated wetlands are identified within the boundaries of the valleyland. Groundwater indicator species observed through valleyland associated with Hay Swamp.	Areas of contiguous woodland are present and consist predominately of deciduous forest (FOD) communities. The area contains greater than 25% natural cover. The area contains wetland communities. Disturbances include agricultural land uses and old roadways, logging, and plantations.	Through aerial photograph interpretation, contiguous natural vegetation with a minimum of 100 m in width occurs for most of the valley length.	No known restoration projects are already underway or planned and awaiting implementation.	Significant considering degree of naturalness and linkage function

4.3.4 Significant Wildlife Habitat

4.3.4.1 Seasonal Concentration Areas of Animals

Waterfowl Stopover and Staging Areas (Terrestrial)

A flock of approximately 1,860 Tundra Swans was observed during the second round of the 2012 spring migration survey at WSST-15 on March 12, 2012. No swans were observed at this location during the first or third round surveys. No swans were observed at WSST-36 during spring migration surveys conducted in the 2010 or 2012 monitoring seasons. Information provided by local residents indicates that water levels at this site in 2012 were significantly lower than in a representative year and that this site is typically used annually by Tundra Swan during spring migration. A summary of the results of the 2012 Tundra Swan migration surveys at WSST-15 and WSST-36 is provided in Table 4.6.

Table 4.6 Tundra Swan Use of Candidate Waterfowl Stopover and Staging Areas

Feature No.	Round 1 Results March 6, 2012	Round 2 Results March 12, 2012	Round 3 Results March 16, 2012	Carried Forward to EIS	Rationale
WSST-15	No Tundra Swans observed.	A flock of approximately 1,860 Tundra Swans observed resting or feeding in a field of corn stubble well away from roads. A second flock of an additional 160 individuals later observed. A few birds observed flying in and increasing the flock size.	No Tundra Swans observed.	Yes	Very large number of Tundra Swans observed, suggests that it is likely used annually.
WSST-36	No Tundra Swans observed.	No Tundra Swans were observed.	No Tundra Swans observed.	Yes	Multiple reports from surrounding landowners indicate that this location is used annually by several flocks of Tundra Swans during migration.

Additional surveys to complete the evaluation of candidate stopover and staging areas are proposed for March 2013 to continue to monitor these areas for use by Tundra Swans. These surveys are proposed in part to evaluate the use of these sites over multiple years and to compensate for the unseasonably warm and dry spring which affected several aspects of the Tundra Swan migration. It is assumed that the lack of flooding in 2012 resulted in swans using a number of fields that they normally might not. Since the species prefers flooded fields, the lack of water in 2012 appears not to have concentrated them in their usual locations. Consequently some fields where Tundra Swans were observed were not identified as candidate Significant Wildlife Habitat.

For the purpose of this submission, the two candidate stopover and staging areas identified (WSST-15 and WSST-36) were treated as significant and carried forward to the EIS with the commitment to complete pre-construction Evaluation of Significance surveys as described in Section 4.2.4.1. The locations of these features are shown on Figure 3.6c.

Bat Maternity Colonies

Of the 19 candidate significant bat maternity colonies identified either within 120 m of proposed turbine locations (17 locations) or proposed to be overlapped by the transmission line (2 location), a total of eight have been evaluated according to the methods described in Section 4.2.4.1. Of these, five were determined to be significant through the Evaluation of Significance (BMC-189, BMC-229, BMC-326, BMC-342 and BMC-757) (NRSI, 2012; refer to Appendix G for details of evaluations). These features were carried forward to the EIS. The locations of these features are shown on Figure 3.6c.

A commitment is made herein to evaluate a total of 11 additional candidate significant bat maternity colonies (BMC-235, BMC-242, BMC-249, BMC-267, BMC-282, BMC-285, BMC-352, BMC-358, BMC-372, BMC-648 and BMC-720) that were introduced to the project area as a result of project changes after 2011 monitoring had completed, and therefore could not be surveyed during the appropriate monitoring season prior to this submission (NRSI, 2012). Refer to Appendix G for the complete bat monitoring report. For the purposes of this submission, these candidate Significant Wildlife Habitats were treated as significant and carried forward to the EIS, with the commitment to complete pre-construction Evaluation of Significance surveys as described in Section 4.2.4.1. The locations of these features are shown on Figure 3.6c.

Turtle Wintering Areas

Candidate significant turtle wintering areas (TOW-01 and TOW-03) will be evaluated following completion of the Evaluation of Significance field studies described in Section 4.2.4.1. For the purposes of this submission, these candidate Significant Wildlife Habitats were treated as significant and carried forward to the EIS, with the commitment to complete pre-construction evaluation of significance surveys as described in Section 4.2.4.1. The locations of these features are shown on Figure 3.6a.

Reptile Hibernacula

Eight candidate significant reptile hibernacula (RH-01, RH-02, RH-03, RH-04, RH-05, RH-06, RH-07 and RH-08) will be evaluated following completion of the Evaluation of Significance field studies described in Section 4.2.4.1. For the purpose of this submission, these candidate Significant Wildlife Habitats were treated as significant and carried forward to the EIS, with the commitment to complete pre-construction Evaluation of Significance surveys as described in Section 4.2.4.1. The locations of these features are shown on Figure 3.6a.

Colonially-nesting Bird Breeding Habitat (Tree/Shrub)

One candidate colonially-nesting bird breeding habitat (CNB-01) was confirmed to be significant as described in Section 4.2.4.1. This candidate Significant Wildlife Habitat was carried forward to the EIS. The location of this feature is shown on Figure 3.6b.

Deer Winter Congregation Areas

No additional field studies are required to evaluate the significance of the deer winter congregation area (DWC-01) identified and mapped by MNR (refer to Figure 3.6b for location). This feature was carried forward to the EIS phase of this Natural Heritage Assessment.

4.3.4.2 Specialize Habitats for Wildlife

Amphibian Woodland Breeding Habitat

The first round of amphibian surveys was conducted in April 2012 at the time when Spring Peepers and Wood Frogs were at their peak calling period and woodland pools were at their deepest levels. These are the two most vociferous and widespread of the woodland breeding amphibians. Pools that support Spotted or Blue-spotted Salamanders nearly always also contain breeding Wood Frogs or Spring Peepers. If no calling amphibians were recorded on the first visit when water was deepest, it was concluded that the woodland pools did not provide good habitat, and probably did not have a sufficient hydroperiod or sufficient food for larvae. Consequently, pools which had no frogs on the first visit were not resurveyed and are not considered to be Significant Wildlife Habitat in this category. While it is possible that some of these pools contain some breeding amphibians, it is unlikely that they would have met the criterion for significance (*i.e.*, 20 breeding individuals).

A summary of the results of 2012 amphibian call surveys is provided in Table 4.7 for candidate significant amphibian woodland breeding habitats. A total of eight features were carried forward to the EIS. These include four confirmed significant features (AWO-14, AWO-25, AWO-27 and AWO-30) and four features treated as significant and carried forward to the EIS (AWO-02, AWO-33, AWO-34 and AWO-35), with commitments for additional pre-construction Evaluation of Significance surveys as described in Section 4.2.4.1. The locations of these features are shown on Figure 3.6d.

Table 4.7 Evaluation of Candidate Amphibian Woodland Breeding Habitats

Feature ID		Call Surveys Targeting Vocalizing Amphibians			Surveys Targeting Non-vocalizing Amphibians		Pre-construction Monitoring Commitments	Carried Forward to EIS
		Round 1	Round 2	Round 3	Egg Mass Survey	Larval Survey		
AWO-02	Not surveyed in 2012.						Pre-construction surveys will be conducted as described in Section 4.2.4.1	Yes – treated as Significant Wildlife Habitat.
AWO-03	Date, Time and Weather Conditions	April 18, 2012 22:45 – 22:50 Wind ¹ : 0 Cloud Cover: 100 % Background Noise ² : 0 Temperature: 5 - 9°C Precipitation: None	May 15, 2012 00:29 – 00:32 Wind: 0 Cloud Cover: 0 % Background Noise: 0 Temperature: 12°C Precipitation: None	June 19, 2012 21:15 – 21:18 Wind: 0 Cloud Cover: 10 % Background Noise: 0 Temperature: 27°C Precipitation: None	April 17, 2012 10:00 – 10:30 Weather: 4°C	May 14, 2012 13:15 – 13:45 Weather: 19°C, sunny	None required.	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant.
	Results	Spring Peepers (3) heard calling.	Green Frogs (2) heard calling.	Green Frogs (5) heard calling.	No amphibians observed.	Northern Leopard Frog (1), Green Frog (3) and an unknown frog species observed.		
AWO-04	Date, Time and Weather Conditions	April 19, 2012 21:15 – 21:20 Wind: 0 Cloud Cover: 100 % Background Noise: 1 Temperature: 9°C Precipitation: None	Not carried over to second round.	Not carried over to third round.	April 17, 2012 15:30 – 17:18 Weather: 3°C	Not carried over to larval survey.	None required.	No – not Significant Wildlife Habitat. Lack of amphibians observed indicates that feature is not likely significant.
	Results	No calls heard.	n/a	n/a	No amphibians observed.	n/a		
AWO-06	Date, Time and Weather Conditions	April 19, 2012 22:40 – 23:34 Wind: 3 Cloud Cover: 90 % Background Noise: 1 Temperature: 10°C Precipitation: -	May 23, 2012 20:58 – 21:01 Wind: 3 Cloud Cover: 10 % Background Noise: 2 Temperature: 15°C Precipitation: None	June 21, 2012 22:30 – 22:33 Wind: 0 Cloud Cover: 95% Background Noise: 0 Temperature: 18°C Precipitation: None	April 19, 2012 14:45 – 16:10 Weather: 10°C, sunny Wind Speed: 15km/hr	May 17, 2012 8:45 – 9:45 Weather: 7°C, clear Wind Speed: 0 km/hr	None required.	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant.
	Results	Spring Peepers (3) heard calling.	No calls heard.	No calls heard	Adult Wood Frogs (2), Green Frog (1) and Western Chorus Frog (1) observed.	No amphibians observed.		
AWO-07	Date, Time and Weather Conditions	April 19, 2012 21:50 – 21:55 Wind: 0 Cloud Cover: 100 % Background Noise: 0 Temperature: 9°C Precipitation: None	May 14, 2012 21:42 – 21:45 Wind: 0 Cloud Cover: 10 % Background Noise: 0 Temperature: 19°C Precipitation: None	June 20, 2012 21:30 – 21:33 Wind: 0 Cloud Cover: 0 % Background Noise: 0 Temperature: 2°C Precipitation: None	April 18, 2012 16:06 – 16:31 Weather: 9°C, sunny Wind: 15km/hr	May 15, 2012 12:10 – 12:45 Weather: 20°C, sunny	None required.	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant. Green Frog is not listed as a target species for this habitat type.

Table 4.7 Evaluation of Candidate Amphibian Woodland Breeding Habitats

Feature ID		Call Surveys Targeting Vocalizing Amphibians			Surveys Targeting Non-vocalizing Amphibians		Pre-construction Monitoring Commitments	Carried Forward to EIS
		Round 1	Round 2	Round 3	Egg Mass Survey	Larval Survey		
	Results	Spring Peepers (7) heard calling.	Grey Tree Frogs (2), Spring Peepers (2) and Green Frogs (2) heard calling.	Green Frog (1) and Grey Tree Frog (1) heard calling.	Red-spotted Newt larvae (>10), adult Green Frogs (3), unknown tadpoles (>20) and unknown adult frog (4) observed.	Green Frog tadpoles (>50), Green Frog adults (3) and adult Northern Leopard Frogs (>5) observed.		
AWO-08	Date, Time and Weather Conditions	April 19, 2012 21:50 – 21:55 Wind: 0 Cloud Cover: 100 % Background Noise: 0 Temperature: 9°C Precipitation: None	May 14, 2012 21:42 – 21:45 Wind: 0 Cloud Cover: 10 % Background Noise: 0 Temperature: 19°C Precipitation: None	June 20, 2012 21:35 – 21:38 Wind: 0 Cloud Cover: 10 % Background Noise: 0 Temperature: 19°C Precipitation: None	April 18, 2012 16:21 – 16:45 Weather: 9°C, sunny Wind: 15 km/hr	May 15, 2012 12:10 – 12:45 Weather: 20°C, sunny	None required.	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant.
	Results	No amphibians heard.	Grey Tree Frogs (2), Spring Peepers (2) and Green Frogs (2) heard calling.	No amphibians heard.	Adult Wood Frog (1) observed.	Green Frog tadpoles (>50), adult Green Frogs (3) and adult Northern Leopard Frogs (5) were observed		
AWO-09	Date, Time and Weather Conditions	April 19, 2012 21:35 – 21:40 Wind: 0 Cloud Cover: 100 % Background Noise: 0 Temperature: 9°C Precipitation: None	May 14, 2012 21:50 – 21:53 Wind: 0 Cloud Cover: 10% Background Noise: 0 Temperature: 19°C Precipitation: None	June 20, 2012 21:40 – 21:43 Wind: 0 Cloud Cover: 0 % Background Noise: 0 Temperature: 28°C Precipitation: None	April 18, 2012 16:48 – 17:10 Weather: 8°C	May 15, 2012 13:00 – 13:35 Weather: 20°C	None required.	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant.
	Results	Spring Peepers (3) and a Western Chorus Frog (1) heard calling.	Spring Peepers (6) and Grey Tree Frogs (6) heard calling.	No calls heard.	Green Frog (1) and an unknown adult frog (3) observed.	An unknown adult frog and Wood Frogs (13) observed.		
AWO-14	Date, Time and Weather Conditions	May 1, 2012 22:58 – 23:01 Wind: 2 Cloud Cover: 100 % Background Noise: 0 Temperature: 7°C Precipitation: None	May 15, 2012 21:09 – 21:12 Wind: 4 Cloud Cover: 60% Background Noise: 2 Temperature: 23°C Precipitation: None	June 21, 2012 21:50 – 21:53 Wind: 0 Cloud Cover: 70% Background Noise: 0 Temperature: 18°C Precipitation: None	Egg mass survey not completed due to access restrictions.	Larval survey not completed due to access restrictions.	None required.	Yes – confirmed Significant Wildlife Habitat. Feature likely to contain breeding population of 1 or more target species with at least 20 individuals therefore considered significant.
	Results	A chorus of Spring Peepers heard calling.	Spring Peepers (6) and American Toads (2) heard calling.	Grey Tree Frogs (3) heard calling.	n/a	n/a		

Table 4.7 Evaluation of Candidate Amphibian Woodland Breeding Habitats

Feature ID		Call Surveys Targeting Vocalizing Amphibians			Surveys Targeting Non-vocalizing Amphibians		Pre-construction Monitoring Commitments	Carried Forward to EIS
		Round 1	Round 2	Round 3	Egg Mass Survey	Larval Survey		
AWO-17	Date, Time and Weather Conditions	April 25, 2012 22:30 – 22:33 Wind: 2 Cloud Cover: 20 % Background Noise: 2 Temperature: 8°C Precipitation: None	Not carried over to second round.	Not carried over to third round.	April 25, 2012 10:23 – 10:43 Weather: 6°C, sunny, light breeze	Not carried over to larval survey.	None required.	No – not Significant Wildlife Habitat. Lack of amphibians observed indicates that feature is not likely significant.
	Results	No calls heard.	n/a	n/a	No amphibians observed.	n/a		
AWO-24	Date, Time and Weather Conditions	May 1, 2012 21:50 – 21:53 Wind: 1 Cloud Cover: 100 % Background Noise: 0 Temperature: 7°C Precipitation: None	May 14, 2012 23:35 – 23:38 Wind: 0 Cloud Cover: 0 % Background Noise: 0 Temperature: 12°C Precipitation: None	June 20, 2012 22:55 – 22:58 Wind: 0 Cloud Cover: 0 % Background Noise: 0 Temperature: 2 8°C Precipitation: None	April 26, 2012 13:20 – 13:50 Weather: 6°C, Overcast Wind: 40 km/hr	May 16, 2012 13:50 – 14:20 Weather: 7°C Wind: 30 km/hr	None required.	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant.
	Results	No calls heard.	Spring Peepers (3), Green Frog (1) and Grey Tree Frogs (4) heard calling.	No calls heard.	No amphibians observed.	No amphibians observed.		
AWO-25	Date, Time and Weather Conditions	May 1, 2012 21:50 – 21:53 Wind: 1 Cloud Cover: 100 % Background Noise: 0 Temperature: 7°C Precipitation: None	May 14, 2012 23:35 – 23:38 Wind: 0 Cloud Cover: 0 % Background Noise: 0 Temperature: 12°C Precipitation: None	June 20, 2012 22:55 – 22:58 Wind: 0 Cloud Cover: 0 % Background Noise: 0 Temperature: 2 8°C Precipitation: None	April 26, 2012 13:20 – 13:50 Weather: 6°C, overcast Wind: 40 km/hr	May 16, 2012 13:50 – 14:20 Weather: 7°C Wind: 30 km/hr	None required.	Yes – confirmed Significant Wildlife Habitat. Feature likely to contain breeding population of 1 or more target species with at least 20 individuals therefore considered significant.
	Results	A chorus of Spring Peepers heard calling.	Spring Peepers (3), Green Frog (1) and Grey Tree Frogs (4) heard calling.	No calls heard.	No amphibians observed.	No amphibians observed.		
AWO-26	Date, Time and Weather Conditions	April 25, 2012 21:40 – 21:43 Wind: 2 Cloud Cover: 40 % Background Noise: 3 Temperature: 8°C Precipitation: None	May 15, 2012 22:58 – 23:01 Wind: 4 Cloud Cover: 60 % Background Noise: 2 Temperature: 19°C Precipitation: None	June 20, 2012 21:03 – 21:06 Wind: 2 Cloud Cover: 0 % Background Noise: 2 Temperature: 17°C Precipitation: None	April 23, 2012 15:20 – 15:50 Weather: 5°C, cloudy Wind: 40 km/hr	May 15, 2012 16:45 – 17:15 Weather: 18°C, sunny	None required.	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant.
	Results	Spring Peepers (4) heard calling.	No calls heard.	No calls heard.	No amphibians observed.	Unknown frog species (4) observed.		

Table 4.7 Evaluation of Candidate Amphibian Woodland Breeding Habitats

Feature ID		Call Surveys Targeting Vocalizing Amphibians			Surveys Targeting Non-vocalizing Amphibians		Pre-construction Monitoring Commitments	Carried Forward to EIS
		Round 1	Round 2	Round 3	Egg Mass Survey	Larval Survey		
AWO-27	Date, Time and Weather Conditions	April 25, 2012 21:30 – 21:33 Wind: 2 Cloud Cover: 40 % Background Noise: 3 Temperature: 8°C Precipitation: None	May 15, 2012 22:52 – 22:55 Wind: 4 Cloud Cover: 60 % Background Noise: 2 Temperature: 19°C Precipitation: None	June 20, 2012 22:55 – 22:- Wind: 2 Cloud Cover: 0 % Background Noise: 2 Temperature: 17°C Precipitation: None	April 23, 2012 13:12 – 13:42 Weather: 5°C, cloudy Wind: 40 km/hr	May 15, 2012 16:07 – 16:40 Weather: 21°C, sunny	None required.	Yes – confirmed Significant Wildlife Habitat. Feature likely to contain breeding population of 1 or more target species with at least 20 individuals therefore considered significant.
	Results	A chorus of Spring Peepers heard calling.	Spring Peepers (7) heard calling.	Green Frogs (2) and Grey Tree Frogs (6) heard calling.	No amphibians observed.	Green Frog tadpoles (2), Red-spotted Newt (1) and an adult American Toad (1) observed.		
AWO-28	Date, Time and Weather Conditions	April 25, 2012 21:58 – 22:01 Wind: 0 Cloud Cover: 40 % Background Noise: 0 Temperature: 9°C Precipitation: None	May 23, 2012 21:27 – 21:30 Wind: 3 Cloud Cover: 10 % Background Noise: 2 Temperature: 15°C Precipitation: None	June 20, 2012 22:02 – 22:05 Wind: 3-5 Cloud Cover: 0% Background Noise: 0 Temperature: 27°C Precipitation: None	April 25, 2012 08:00 – 09:45 Weather: 5°C, sunny, 0% cloud cover Wind: slight breeze	May 16, 2012 12:00 – 12:50 Weather: 7°C Wind: 30 km/hr	None required.	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant.
	Results	Spring Peepers (3) heard calling.	No calls heard.	No calls heard.	No amphibians observed.	No amphibians observed.		
AWO-30	Date, Time and Weather Conditions	April 25, 2012 20:49 – 20:51 Wind: 1 Cloud Cover: 100 % Background Noise: 1 Temperature: 9°C Precipitation: None	May 15, 2012 23:37 – 23:40 Wind: 4 Cloud Cover: 40 % Background Noise: 2 Temperature: 17°C Precipitation: None	June 20, 2012 21:31 – 21:34 Wind: 3 Cloud Cover: 0 % Background Noise: 0 Temperature: 28°C, hazy Precipitation: None	April 23, 2012 17:30 – 18:00 Weather: 5°C, Cloudy Wind: 45 km/hr	May 16, 2012 10:00 – 11:17 Weather: 7°C Wind: 30 km/hr	None required.	Yes – confirmed Significant Wildlife Habitat. Feature likely to contain breeding population of 1 or more target species with at least 20 individuals therefore considered significant.
	Results	A large chorus of Spring Peepers and one Northern Leopard Frog heard calling.	No calls heard.	No calls heard.	No amphibians observed.	Adult Green Frogs (2), American Toad (3) and unknown adult frogs (4) observed.		
AWO-33	Not surveyed in 2012.						Pre-construction surveys will be conducted as described in Section 4.2.4.1	Yes – treated as Significant Wildlife Habitat

Table 4.7 Evaluation of Candidate Amphibian Woodland Breeding Habitats

Feature ID	Call Surveys Targeting Vocalizing Amphibians			Surveys Targeting Non-vocalizing Amphibians		Pre-construction Monitoring Commitments	Carried Forward to EIS
	Round 1	Round 2	Round 3	Egg Mass Survey	Larval Survey		
AWO-34	Not surveyed in 2012.					Pre-construction surveys will be conducted as described in Section 4.2.4.1	Yes – treated as Significant Wildlife Habitat
AWO-35	Not surveyed in 2012.					Pre-construction surveys will be conducted as described in Section 4.2.4.1	Yes – treated as Significant Wildlife Habitat

Notes:

1. Beaufort Wind Scale:

- 0: 0-2 km/hr – calm
- 1: 3-5 km/hr – light air movement
- 2: 6-11 km/hr – slight breeze – can feel on face
- 3: 12-19 km/hr – gentle breeze – leaves move on twigs
- 4: 20-30 km/hr – moderate breeze – small branch moves
- 5: 31-38 km/hr – fresh breeze – moderate branch moves
- 6: 39 – 49 km/hr – strong breeze – large branch moves

2. Background Noise Scale:

- 0: no appreciable effects
- 1: slight – distant traffic (1 car)
- 2: moderate – distant traffic (2-5)
- 3: serious – continuous traffic nearby (6-10 cars)
- 4: profound – continuous traffic passing

Amphibian Wetland Breeding Habitat

Deciduous swamps identified as candidate amphibian breeding habitats were assessed as Amphibian Woodland Breeding Habitat and described in the section above. A summary of the results of 2012 amphibian call surveys is provided in Table 4.8 for the one candidate amphibian wetland breeding habitat identified (AWE-29). The feature was determined to not be significant and was not carried forward to the EIS.

Table 4.8 Evaluation of Candidate Amphibian Wetland Breeding Habitat

Feature ID		Call Surveys Targeting Vocalizing Amphibians			Surveys Targeting Non-vocalizing Amphibians		Carried Forward to EIS
		Round 1	Round 2	Round 3	Egg Mass Survey	Larval Survey	
AWE-29	Date, Time and Weather Conditions	April 25, 2012 21:13 – 21:16 Wind: 1 Cloud Cover: 10% Background Noise: 1 Temperature: 9°C Precipitation: None	May 15, 2012 23:30 – 23:33 Wind: 3 Cloud Cover: 40% Background Noise: 1 Temperature: 17°C Precipitation: None	June 20, 2012 22:15 – 22:18 Wind: 3 Cloud Cover: 0% Background Noise: 0 Temperature: 19°C Precipitation: None	April 24, 2012 08:30 – 10:10 Weather: 3°C, cloudy Wind: 45 km/hr	May 16, 2012 11:25 – 11:45 Weather: 7°C Wind: 30 km/hr	No – not Significant Wildlife Habitat. Well below threshold of 20 calling and lack of amphibians observed indicates that feature is not likely significant.
	Results	No calls heard.	No calls heard.	No calls heard.	One unknown adult frog observed.	No amphibians observed.	

4.3.4.3 *Habitat for Species of Conservation Concern*

Habitat for Plant Species of Conservation Concern

Six features (SCP-12, SCP-13, SCP-14, SCP-15, SCP-16 and SCP-17) were determined to be significant based on confirmed observances of Burning Bush, Cream Violet, Field Thistle, Narrow-leaved Sedge and Perfoliate Bellwort during 2011 and 2012 Site Investigations and carried forward to the EIS. The locations of these features are shown on Figure 3.6a.

A total of 11 Candidate Significant Wildlife Habitats (SCP-01, SCP-02, SCP-03, SCP-04, SCP-05, SCP-06, SCP-07, SCP-08, SCP-09, SCP-10 and SCP-11) were identified through Site Investigations as containing suitable habitat for Burning Bush, Green Dragon, Hairy Bedstraw, Harbinger-of-spring, Pawpaw, Round-leaved Groundsel, Round-leaved Hawthorn and Slim-flowered Muhly requiring Evaluation of Significance studies. Results from vascular plant surveys conducted during appropriate times of the year indicated that no plant Species of Conservation Concern were observed in these candidate Significant Wildlife Habitats (Table 4.9). As a result, none of these natural areas were deemed to contain habitat for plant Species of Conservation Concern and thus were not carried forward to the EIS. A detailed list of all vascular plant species observed within each natural area is presented in Appendix H.

Table 4.9 Evaluation of Candidate Habitat for Plant Species of Conservation Concern

Plant Species of Conservation Concern	Feature ID	Confirmed Significant Wildlife Habitat	Candidate Significant Wildlife Habitat	ELC Unit	Date of Vascular Plant Survey	Distance to Project Location	Species Observed	Carried Forward to EIS
Burning Bush (<i>Euonymus atropurpureus</i>) S3 - Vulnerable	SCP-12	326	n/a	FOD5-2	September 22, 2011	>0.1 m (access road)	Yes	Yes – Significant Wildlife Habitat
	SCP-03	n/a	648	FOD9a	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-10	n/a	662	FOD8-1	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-04	n/a	662	FOD5-6	May 31, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-05 SCP-11	n/a	720	FOD6-5 FOD7f	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
SCP-06 SCP-09	n/a	721	FOD6-5 FOD7-1	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat	
Cream Violet (<i>Viola striata</i>) S3 - Vulnerable	SCP-14	757	n/a	FOD6-5	June 1, 2011	78 m (access road)	Yes	Yes – Significant Wildlife Habitat
Field Thistle (<i>Cirsium discolor</i>) S3 - Vulnerable	SCP-13	198	n/a	CUM1-1	May 17, 2012	>0.1 (access road)	Yes	Yes – Significant Wildlife Habitat
Green Dragon (<i>Arisaema dracontium</i>) S3 - Vulnerable	SCP-03	n/a	648	FOD9a	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-05 SCP-11	n/a	720	FOD6-5 FOD7f	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-06 SCP-09	n/a	721	FOD6-5 FOD7-1	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
Hairy Bedstraw (<i>Galium pilosum</i>) S3 - Vulnerable	SCP-04	n/a	662	FOD5-6	May 31, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
Harbinger-of-Spring (<i>Erigenia bulbosa</i>) S3? - Vulnerable? (rank uncertain)	SCP-03 SCP-10	n/a	648	FOD9a FOD8-1	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-05 SCP-11	n/a	720	FOD6-5 FOD7f	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-06 SCP-09	n/a	721	FOD6-5 FOD7-1	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
Pawpaw (<i>Asimina triloba</i>) S3 - Vulnerable	SCP-03	n/a	648	FOD9a	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-05	n/a	720	FOD6-5	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-06 SCP-09	n/a	721	FOD6-5 FOD7-1	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
Perfoliate Bellwort (<i>Uvularia perfoliata</i>) S1 - Critically Imperiled	SCP-16 SCP-17	375	n/a	FOD6-5 FOM6-1	Oct 5, 2011	29 m (access road)	Yes	Yes – Significant Wildlife Habitat

Table 4.9 Evaluation of Candidate Habitat for Plant Species of Conservation Concern

Plant Species of Conservation Concern	Feature ID	Confirmed Significant Wildlife Habitat	Candidate Significant Wildlife Habitat	ELC Unit	Date of Vascular Plant Survey	Distance to Project Location	Species Observed	Carried Forward to EIS
Narrow-leaved Sedge <i>(Carex amphibola)</i> S2 - Imperiled	SCP-15	189	n/a	FOD9-5	July 13, 2011	178 m (access road)	Yes	Yes – Significant Wildlife Habitat
Round-leaved Groundsel <i>(Packera obovata)</i> S3 - Vulnerable	SCP-03	n/a	648	FOD9a	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-05	n/a	720	FOD6-5	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-06 SCP-09	n/a	721	FOD6-5 FOD7-1	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
Round-leaved Hawthorn <i>(Crataegus lumaria)</i> S3? - Vulnerable? (rank uncertain)	SCP-01	n/a	635	CUM1-1	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-02	n/a	637	CUM1-1	May 31, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-07	n/a	648	CUM1-1	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-08	n/a	720	CUM1-1	June 6, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
Slim-flowered Muhly <i>(Muhlenbergia tenuiflora)</i> S2 - Imperiled	SCP-04	n/a	662	FOD5-6	May 31, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat
	SCP-03	n/a	648	FOD9a	June 5, 2012	0 m (transmission line in feature)	No	No – not Significant Wildlife Habitat

Habitat for Bird Species of Conservation Concern

A summary of the results of woodland breeding bird surveys conducted in five wooded areas where tree removal is proposed in association with the transmission line (SCB-01, SCB-02, SCB-03, SCB-04 and SCB-05) is provided in Table 4.10.

Evidence of breeding Red-headed Woodpecker was recorded at one location (SCB-03) and a Red-headed Woodpecker nest was later confirmed within the woodland. This natural area as described in Table 4.10 was, therefore, identified as Significant Wildlife Habitat for Red-headed Woodpecker and carried forward to the EIS. The location of this feature is shown on Figure 3.6d.

Table 4.10 Evaluation of Candidate Significant Wildlife Habitat for Woodland Breeding Bird Species of Conservation Concern

Feature ID	Natural Area No.	ELC Unit	Round 1 Survey		Round 2 Survey		Round 3 Survey		Carried Forward to EIS
			Date, Time and Weather Conditions	Results	Date, Time and Weather Conditions	Results	Date, Time and Weather Conditions	Results	
SCB-01	648	FOD8-1 FOD9a	6/7/2012 08:30 – 10:00 Wind Direction: W Wind Scale: 1 Sky Condition: 1 Cloud Cover: 30% Temperature: 15°C	No bird species of conservation concern observed.	6/21/2012 08:19 – 08:29 Wind Direction: W Wind Scale: 1 Sky Condition: - Cloud Cover: 20% Temperature: 24°C	No bird species of conservation concern observed.	7/4/2012 09:26 – 09:36 Wind Direction: NE Wind Scale: 1-2 Sky Condition: 2 Cloud Cover: 100% Temperature: 25°C	No bird species of conservation concern observed.	No – not Significant Wildlife Habitat
SCB-02	662	FOD5-6	6/7/2012 06:30 – 06:40 Wind Direction: W Wind Scale: 2 Sky Condition: 1 Cloud Cover: 45% Temperature: 14°C	No bird species of conservation concern observed.	6/18/2012 06:26 – 06:36 Wind Direction: SW Wind Scale: 1 Sky Condition: 2 Cloud Cover: 100% Temperature: 17°C	No bird species of conservation concern observed.	6/30/2012 09:14 – 09:35 Wind Direction: E Wind Scale: 2 Sky Condition: 1 Cloud Cover: 5% Temperature: 25°C	No bird species of conservation concern observed.	No – not Significant Wildlife Habitat
SCB-03	720	FOD6-5 FOD7f	5/30/2012 08:21 – 09:15 Wind Direction: - Wind Scale: 0 Sky Condition: 0 Cloud Cover: 0% Temperature: 18°C	No bird species of conservation concern observed.	6/22/2012 07:53 – 08:03 Wind Direction: NW Wind Scale: 3 Sky Condition: 0 Cloud Cover: 10% Temperature: 19°C	Pair of Red-headed Woodpeckers observed within woodlot. Both birds observed together in area with many suitable nesting sites with snags at canopy height. The pair stayed in the same area for 35 to 40 minutes indicating that the female may be incubation or pre-laying.	7/2/2012 06:38 – 06:48 Wind Direction: NW Wind Scale: 0-1 Sky Condition: 0 Cloud Cover: 0% Temperature: 16°C	Male Red-headed Woodpecker observed in suitable habitat.	Yes – confirmed Significant Wildlife Habitat
SCB-04	721	FOD6-5 FOD7-1 SWD3-3	6/13/2012 07:57 – 09:14 Wind Direction: N Wind Scale: 2 Sky Condition: 0 Cloud Cover: 0% Temperature: 13°C	No bird species of conservation concern observed.	6/26/2012 09:19 – 09:29 Wind Direction: NW Wind Scale: 1 Sky Condition: 1 Cloud Cover: 40% Temperature: 18°C	No bird species of conservation concern observed.	7/6/2012 05:56 – 06:06 Wind Direction: 0 Wind Scale: 0 Sky Condition: 0 Cloud Cover: 0% Temperature: 22°C	No bird species of conservation concern observed.	No – not Significant Wildlife Habitat
SCB-05	722	SWD3-3	6/13/2012 08:52 – 09:08 Wind Direction: N Wind Scale: 3 Sky Condition: 0 Cloud Cover: 0% Temperature: 13°C	No bird species of conservation concern observed.	6/26/2012 09:38 – 09:48 Wind Direction: NW Wind Scale: 2 Sky Condition: 1 Cloud Cover: 20% Temperature: 19°C	No bird species of conservation concern observed.	7/6/2012 06:15 – 06:25 Wind Direction: 0 Wind Scale: 0 Sky Condition: 0 Cloud Cover: 0% Temperature: 23°C	No bird species of conservation concern observed.	No – not Significant Wildlife Habitat

Beaufort Wind Scale: 0: 0-2 km/hr – calm, smoke rises vertically
1: 3-5 km/hr – light air movement
2: 6-11 km/hr – wind felt on face; leaves rustle
3: 12-19 km/hr – leaves/small twigs in constant motion
4: 20-30 km/hr – dust/loose papers below; small branches move
5: 31-38 km/hr – fresh breeze – moderate branch moves
6: 39-49 km/hr – strong breeze – large branch moves

Sky Conditions Indicators: 0: Clear or few clouds
1: Partly cloudy
2: Cloudy (broken) or overcast
4: Fog or Smoke
5: Drizzle
7: Snow
8: Showers

4.3.4.4 Animal Movement Corridors

Amphibian Movement Corridors

Candidate amphibian woodland and wetland breeding habitats were identified and evaluated to determine if they contain Significant Wildlife Habitat under the amphibian woodland breeding habitat and amphibian wetland breeding habitat criteria as described above. A total of eight amphibian woodland breeding habitats were carried forward to the EIS, including four confirmed significant features (AWO-14, AWO-25, AWO-27 and AWO-30) and four features treated as significant (AWO-02, AWO-33, AWO-34 and AWO-35) with commitments for additional pre-construction Evaluation of Significance surveys as described in Section 4.2.4.1. No additional amphibian wetland breeding habitats were confirmed or treated as significant.

These eight breeding areas were examined in the context of the landscape to identify potential or likely movement corridors based on the configuration of naturally vegetated areas and breeding sites. No potential amphibian movement corridors that meet the criteria as described in the Ecoregion 6E and 7E Criterion Schedule Addendums to the SWHTG (MNR, 2011e; MNR, 2011f) were identified in associated with these amphibian breeding habitats. Therefore, this type of Significant Wildlife Habitat was not carried forward to the EIS.

Deer Movement Corridors

For the purpose of this submission, the candidate significant deer movement corridor (WOD-331) was assumed to be significant as described in Section 4.2.4.1. This feature was carried forward to the EIS phase of this Natural Heritage Assessment. The location of this feature is shown on Figure 3.6b.

4.3.4.5 Generalized Candidate Significant Wildlife Habitat

Evaluation of Significance studies are not required for Generalized Candidate Significant Wildlife Habitat, as described in Appendix D of the Natural Heritage Assessment Guide (MNR, 2011a). The following generalized candidate Significant Wildlife Habitats were confirmed within the 120 m Area of Investigation however not within 120 m of qualifying project infrastructure, and were therefore carried forward to the EIS as Generalized Candidate Significant Wildlife Habitat:

- Bat maternity colonies (numerous; refer to Section 3 of this report);
- Turtle wintering areas (natural areas 255, 266, 609, 720 and 754);
- Reptile hibernacula (natural areas 236, 661 and 695);
- Mature forest stands (numerous; refer to Section 3 of this report);
- Other rare vegetation communities (natural area 309);
- Waterfowl nesting areas (natural area 209);
- Woodland raptor nesting habitat (Woodland units WOD-117, WOD-131 and WOD-331);
- Turtle nesting areas (natural area 209);
- Seeps and springs (natural areas 232, 249, 266, 267, 273, 280, 309, 369, 609 and 723);
- Amphibian woodland breeding habitat (natural areas 209, 210, 232, 236, 255, 266, 269, 280, 309, 342 and 375);
- Amphibian wetland breeding habitat (natural areas 236, 609 and 754);
- Woodland area-sensitive bird breeding habitat (WOD-131 and WOD-331);
- Terrestrial crayfish habitat (natural area 225);
- Habitats of plant species of conservation concern (numerous; refer to Section 3 of this report);
- Habitat of bird species of conservation concern (numerous; refer to Section 3 of this report); and,
- Habitat of insect species of conservation concern (numerous; refer to Section 3 of this report).

4.4 Summary of Features Carried Forward to the Environmental Impact Study

Table 4.11 provides a summary of the natural features treated as or confirmed to be Significant or Provincially Significant and located in the Project Location or in or within the 120 m Area of Investigation. These features were carried forward to the EIS.

Table 4.11 Summary of Natural Features Carried Forward to the Environmental Impact Study

Feature	Natural Features Carried Forward to the EIS
Wetlands	The following 14 wetland complexes were treated as significant and carried forward to the EIS: <ul style="list-style-type: none"> • WET-006, WET-008, WET-009, WET-010, WET-011, WET-012, WET-014, WET-019, WET-021, WET-025, WET-032, WET-038, WET-049 and WET-053.
Woodlands	The following 65 woodlands were determined to be significant and carried forward to the EIS: <ul style="list-style-type: none"> • WOD-001, WOD-012, WOD-018, WOD-023, WOD-026, WOD-028, WOD-032, WOD-033, WOD-034, WOD-047, WOD-049, WOD-053, WOD-054, WOD-060, WOD-063, WOD-064, WOD-068, WOD-070, WOD-076, WOD-087, WOD-093, WOD-101, WOD-103, WOD-104, WOD-106, WOD-109, WOD-112, WOD-113, WOD-114, WOD-117, WOD-118, WOD-120, WOD-129, WOD-130, WOD-131, WOD-133, WOD-134, WOD-135, WOD-136, WOD-137, WOD-145, WOD-146, WOD-149, WOD-154, WOD-158, WOD-176, WOD-180, WOD-191, WOD-200, WOD-210, WOD-227, WOD-231, WOD-251, WOD-278, WOD-286, WOD-289, WOD-295, WOD-300, WOD-301, WOD-303, WOD-306, WOD-309, WOD-313, WOD-328 and WOD-331.
Valleylands	The following valleyland feature was determined to be significant and carried forward to the EIS: <ul style="list-style-type: none"> • VAL-02
Significant Wildlife Habitat	<p>The following Significant Wildlife Habitats were <i>evaluated and determined to be significant</i> in or within the 120 m Area of Investigation and within 120 m of qualifying project infrastructure, and were therefore carried forward to the EIS:</p> <ul style="list-style-type: none"> • Bat maternity colonies (BMC-189, BMC-229, BMC-326, BMC-342 and BMC- 757); • Colonially-nesting bird breeding habitat (tree/shrub) (CNB-01); • Amphibian woodland breeding habitat (AWO-14, AWO-25, AWO-27 and AWO-30); • Habitat for plant species of conservation concern (multiple) (SCP-12, SCP-13, SCP-14, SCP-15, SCP-16 and SCP-17); and, • Habitat for bird species of conservation concern (Red-headed Woodpecker) (SCB-03). <p>The following features were <i>treated as significant</i> for the purpose of this submission and carried forward to the EIS (in some cases, a determination as to whether the mitigation measures described in the EIS will be applied will be made based on the outcome of pre-construction surveys):</p> <ul style="list-style-type: none"> • Waterfowl stopover and staging areas (terrestrial) (WSST-15 and WSST-36); • Bat maternity colonies (BMC-235, BMC-242, BMC-249, BMC-267, BMC-282, BMC-285, BMC-352, BMC-358, BMC-372, BMC-648 and BMC-720); • Turtle wintering areas (TOW-01 and TOW-03); • Reptile hibernacula (RH-01, RH-02, RH-03, RH-04, RH-05, RH-06, RH-07 and RH-08); • Deer winter congregation area (DWC-01); • Amphibian woodland breeding habitat (AWO-02, AWO-33, AWO-34 and AWO-35); and, • Deer movement corridor (WOD-331). <p>The following candidate Significant Wildlife Habitats were identified within the 120 m Area of Investigation however not within 120 m of qualifying project infrastructure, and were therefore carried forward to the EIS as generalized candidate Significant Wildlife Habitat:</p> <ul style="list-style-type: none"> • Bat maternity colonies (numerous); • Turtle wintering areas (natural areas 255, 266, 609, 720 and 754); • Reptile hibernacula (natural areas 236, 661 and 695); • Mature forest stands (numerous); • Other rare vegetation communities (natural area 309); • Waterfowl nesting areas (natural area 209); • Woodland raptor nesting habitat (Woodland units WOD-117, WOD-131 and WOD-331); • Turtle nesting areas (natural area 209); • Seeps and springs (natural areas 232, 249, 266, 267, 273, 280, 309, 369, 609 and 723); • Amphibian woodland breeding habitat (natural areas 209, 210, 232, 236, 255, 266, 269, 280, 309, 342 and 375); • Amphibian wetland breeding habitat (natural areas 236, 609 and 754); • Woodland area-sensitive bird breeding habitat (WOD-131 and WOD-331); • Terrestrial crayfish habitat (natural area 225); • Habitats of plant species of conservation concern (numerous); • Habitat of bird species of conservation concern (numerous); and, • Habitat of insect species of conservation concern (numerous).

5. Environmental Impact Study

5.1 REA Requirements

Under Section 38 (2) of O. Reg. 359/09, an Environmental Impact Study (EIS) must be conducted for all significant natural features that are within 120 m of the Project Location. Under the REA process, the EIS must:

- Identify and assess any negative environmental effects of the project on significant natural features as a result of construction, operation, or decommissioning of the Project;
- Identify appropriate mitigation measures to address any negative environmental effects;
- Identify any residual effects that are expected to remain after mitigation measures are applied;
- Identify the significance of any residual effects;
- Describe how the environmental effects monitoring plan addresses any negative environmental effects; and
- Describe how the construction plan report addresses any negative environmental effects.

The effects and mitigation measures described in this EIS are consistent with the conclusions presented in the draft Goshen Construction Plan Report (AECOM, 2012b) and the draft Goshen Design and Operation Report (AECOM, 2012c), the latter including the Environmental Effects Monitoring Plan.

Table 4.5 summarizes the significant natural features that have been carried forward to the EIS during the Natural Heritage Assessment process for the proposed Project. Potential negative effects to these features are addressed herein.

No part of the proposed Project is located within a significant wetland (all wetlands were treated as Provincially Significant); however, vegetation removal for the proposed transmission line will occur within significant woodlands and Significant Wildlife Habitats. The transmission line is also proposed within a significant valleyland feature, although no vegetation removal is required in this feature. As well, various portions of the Project are proposed within 120 m of significant features including wetlands, woodlands, wildlife habitat and valleylands.

The following section (Section 5.2) provides an overview of the proposed Project, as described in the draft Construction Plan Report. The potential effects, mitigation measures, and residual effects on features determined to be significant or treated as significant and therefore carried forward to the EIS are described in Sections 5.3 to 5.8 of this report. Section 5.9 describes how the Construction Plan Report addresses negative environmental effects to significant natural features. Finally, Section 5.10 describes how the environmental effects monitoring plan addresses any negative environmental effect to significant natural features.

5.2 Project Description

5.2.1 Facility Components

For the purpose of this EIS and as shown on Figure 1.2, the major components of the Project are proposed to be:

- Up to 71 GE 1.6-100 Wind Turbine generator locations and pad mounted step-up transformers and one GE 1.56-100 Wind Turbine generator location and pad mounted step-up transformer (however, only 63 turbines will be constructed);
- Turbine laydown and storage areas (including temporary staging areas, crane pads and turnaround areas surrounding each wind turbine);

- Construction laydown area for the purposes of providing temporary storage of construction materials and temporary construction offices and ancillary equipment such as electrical service from the local electrical distribution line;
- A transformer substation and ancillary equipment;
- 34.5 kV electrical collection lines to connect the turbines to the transformer substation and other ancillary equipment such as above-ground junction boxes;
- 115 kV transmission line to run from the transformer substation to a breaker switch station which will connect the electricity generated by the project to the existing Hydro One 115 kV transmission line;
- Turbine access roads;
- Three permanent meteorological towers; and,
- An operations and maintenance building and ancillary equipment such as an electrical service line connected to the local distribution service.

The Project components, in addition to the Disturbance Area, as shown on Figure 1.2, occupy approximately 623 hectares (ha) (1,539 acres) of land in the Municipalities of Bluewater and South Huron.

5.2.1.1 Turbine Specifications

With a total nameplate capacity of 102 MW, the Project is categorized as a Class 4 facility under *O. Reg. 359/09*. Although NextEra is seeking an REA for up to 72 wind turbines, only 63 are proposed to be constructed for the Project.

The wind turbine technology proposed for this Project is the GE 1.6-100 Wind Turbine and GE 1.56-100 Wind Turbine (one turbine only). The turbines are 3-bladed, upwind, horizontal-axis wind turbines that are state of the art technology. The turbines have a 100 m rotor diameter with a swept area of 7,854 m²; each blade is connected to the main shaft via the hub. The turbine is mounted on an 80 m tubular steel tower which contains an internal ladder provided for maintenance access. The turbine will be constructed on a foundation that is approximately 400 m². The foundation consists of poured concrete and steel rebar to provide added strength.

The nacelle houses the main components of the wind turbine such as the rotor shaft, gear box, couplings, control panel, bearing brackets and the generator. The nacelle is equipped with sound-proofing, is ventilated and the interior is illuminated with electric lights. Some of the wind turbines will have external lighting in accordance with the requirements of Transport Canada (TC).

A summary of the turbine specifications is provided in Table 5.1 below. Please refer to the Wind Turbine Specification Report (AECOM, 2012d) for further information.

Table 5.1 Summary of Technical Specifications

Specification	GE 1.6-100 Wind Turbine	GE 1.56-100 Wind Turbine
Make	General Electric	General Electric
Model	1.6-100	1.56-100
Name Plate Capacity	1.62 MW	1.56 MW
Hub Height	80 m	80 m
Rotor Diameter	100 m	100 m
Minimum Rotational Speed	9.75 rpm	9.75 rpm
Maximum Rotational Speed	15.33 rpm	16.2 rpm

5.2.1.2 *Construction Laydown and Storage Areas*

A temporary laydown and storage area will be constructed on privately owned land for the purpose of staging and storing equipment during the construction phase. A temporary electrical service line will be connected to the local distribution line for the purpose of providing electrical power to the construction offices. Activities on this site will include materials storage, equipment refuelling, and construction offices. The area will be approximately 4 hectares (10 acres) in area.

5.2.1.3 *Turbine Laydown and Storage Areas*

An approximately 122 m by 122 m square around each wind turbine will be established for the laydown and assembly of the wind turbine components. The construction trailers will receive electrical power through a temporary electrical service line connected to the local distribution line.

5.2.1.4 *Collection Lines*

The system that connects each turbine to the transformer substation will consist of 34.5 kV electrical collection lines that will be buried 1 m below grade on private property or within the municipal road right of way. There may be occasional locations where the collection lines are placed above ground on wood, concrete or steel poles for technical reasons. Above ground electrical junction boxes will be used to connect sections of underground collection lines.

5.2.1.5 *Transformer Substation and Breaker Switch Station*

Approximately 2 to 3 ha in size, the transformer substation will either be located on privately held lands through a lease agreement or on land purchased by Goshen Wind, Inc. The electricity collected via the 34.5 kV underground collection lines will converge at the transformer substation where the electricity will be “stepped-up” to 115 kV for transmission and then routed to a breaker switch station. The breaker switch station will occupy less than 0.4 ha (1 acre) of land and is the connection point with the existing Hydro One 115 kV transmission line. The substation equipment will include an isolation switch, a circuit breaker, a step-up transformer, transmission switch gear, instrument transformers, grounding and metering equipment. All substation grounding equipment will meet the Ontario Electrical Safety Code. The substation will be connected to the existing electrical distribution line to supply power for the control house lighting and equipment.

5.2.1.6 *Electrical Transmission*

A 115 kV electrical transmission line from the step-up transformer substation to the connection point with the Provincial electricity grid is proposed to be located on private property, or within existing road right-of-ways. It is anticipated that the transmission line will be mounted on new transmission line poles. The poles are proposed to be constructed of wood, concrete or steel and will be between 18 and 30 m tall.

The interconnection plan for any wind energy centre is subject to study, design and engineering by the Independent Electricity System Operator which manages the province’s electricity grid, Hydro One and the Ontario Energy Board, which regulates the industry through the Transmission System Code and the Distribution System Code.

5.2.1.7 Access Roads

On-site access roads to each turbine will be constructed to provide an access point to the properties for equipment transport during the construction phase and for maintenance activities during operation. Typically the access roads will be 11 m wide during the construction phase to accommodate the large cranes (with an additional 2 m clearance on each side for travel), and may be reduced in width at the landowner's request following construction.

5.2.1.8 Operations and Maintenance Building

An operations building, approximately 30 m by 15 m in size, will be constructed on privately held lands (on or near the same parcel as the substation for the Project) for the purpose of monitoring the day-to-day operations of the wind energy centre and supporting maintenance efforts. A small parking lot will be constructed to accommodate staff vehicles. Prior to the construction phase, a Stormwater Pollution Prevention Study will be conducted to address any potential effects associated with stormwater runoff.

Potable water will be supplied by a well or through the municipal water system and a septic bed will be constructed for the disposal of sewage. The septic bed will be constructed to the minimum size required for the size of the operation and maintenance building. It is the Project owner's responsibility to ensure proper maintenance of the septic system. The operations and maintenance building, septic system and water supply will be constructed in accordance with applicable municipal and provincial standards.

5.2.1.9 Permanent Meteorological Tower

Permanent meteorological towers are an operational requirement of the Independent Electricity System Operator (IESO) as an electricity market participant (this includes all generators of electricity) and allow the IESO to operate the system reliably and safely.

Three permanent meteorological towers will be installed at the Project. The towers are typically up to 80 m in height. No significant soil or vegetation disturbance is anticipated. The use of meteorological data is key to the safe and efficient operation of a wind energy centre. Some operational decisions made using meteorological data include:

- Cut-in wind speed;
- Cut-out wind speed;
- Turbine shut down during potential icing conditions; and,
- Turbine shut down during extreme weather events.

5.2.1.10 Water Crossings

To the extent possible, Project infrastructure has been sited to minimize the number of water crossings. The Water Assessment and Water Body Report (AECOM, 2012a), which has been developed as part of the REA, describes all water crossings and associated mitigation measures.

5.2.2 Construction Activities

The sections below, adapted from the draft Construction Plan Report (AECOM, 2012b), summarize the construction phase activities.

5.2.2.1 *Surveying and Geotechnical Study Activities*

Existing buried infrastructure located on public property will be identified using the Ontario One Call service and buried infrastructure located on private property will be identified by private contractors prior to construction and updated throughout construction, as required.

Geotechnical sampling will be required for turbine foundation locations. Typically, a truck-mounted drill rig visits the sampling locations, drills the borehole and collects geotechnical information. This operation typically uses two operators and requires one to two hours per turbine location.

Equipment will include, at a minimum, trucks, a truck mounted drill rig, and possibly a track-mounted drill rig. The trucks will be driven to the site via existing municipal roads. No materials will be brought on site for these activities and any waste generated would be comprised of drill cuttings which will be scattered in the vicinity of the boreholes. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling for all construction activities will be conducted in compliance with the mitigation measures outlined below.

5.2.2.2 *Land Clearing and Construction of Access Roads*

Access roads will be constructed to transport equipment to the construction sites and for maintenance activities during operation. There will be a 60 m wide area of potential disturbance associated with the construction of the access roads. The access road will be sited within this area of disturbance in consultation with the landowner and taking into consideration potential environmental effects.

The construction of the access road will typically require clearing and grubbing of any vegetation, excavation of the topsoil layer and adding a layer of compacted material to a typical thickness of 300 mm to 600 mm, depending upon site specific geotechnical conditions. Clean granular material (typically "A" or "B" gravel) will be brought to the site as needed and will not be stockpiled onsite. The topsoil will be kept and re-used on site. The access road to each turbine will typically require one to three days of construction time. Depending on the length of the access roads, construction may require approximately 25 trucks of gravel.

New culverts may be required to maintain drainage in ditches at junctions with roadways and these will be constructed to support the construction equipment and delivery trucks. The exact details of culverts and their installation in addition to erosion control measures will be determined in conjunction with the Ausable Bayfield Conservation Authority (ABCA) and the Upper Thames River Conservation Authority (UTRCA) as part of their permitting process. The culverts are proposed to be open bottom and left in place following the operation phase.

Equipment will include, at a minimum, trucks, graders, and bulldozers. Municipal and provincial roads will also be used for transporting equipment. Any road damages associated with the Project will be repaired prior to the completion of the construction phase. A Road Use Agreement will be developed in consultation with the municipalities. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment.

5.2.2.3 *Construction of Laydown Areas*

A 4 hectare (10 acre) site will be constructed for the temporary storage of construction material and as a site for the construction office trailers. Following clearing and grubbing of any vegetation, the topsoil at the temporary laydown area will be removed and approximately 600 mm of clean compacted crushed gravel will be imported as needed. The excavated topsoil will be re-used on site as feasible. A temporary electrical service line will be connected to the existing distribution line adjacent to the laydown area for the purpose of providing power to the construction office

trailers. Construction activities are expected to last approximately one week and will require approximately 100 loads of gravel, and a crew of six people. Following the construction phase, the gravel will be removed from the site or re-used, to be determined in consultation with the landowner. The temporary electrical service line and poles will be removed. The stockpiled topsoil will then be redistributed throughout the temporary laydown area.

Equipment will include, at a minimum, trucks, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below.

5.2.2.4 Construction of Turbine Sites and Crane Pads

Prior to construction, the construction area will be cleared and grubbed. In order to provide sufficient area for the laydown of the wind turbine components and its assembly, a 122 m by 122 m square around the wind turbine must be cleared, levelled, and be accessible during the construction phase. The topsoil is typically removed and some soil stabilizing material (i.e., crushed gravel or clean back fill) may need to be added depending upon site specific geotechnical conditions. Where the site laydown areas are close to watercourses, erosion control measures will be implemented, as outlined in section 5.9

Crane pads will be constructed at the same time as the road and will be located adjacent to the turbine locations. The crane pads will typically be 15 m by 35 m in area. The topsoil at the crane pad will be removed and approximately 600 mm of clean compacted crushed gravel will be imported as needed. The excavated topsoil will be re-used on site as feasible. The construction crew is anticipated to require four to six people and construction activities are expected to last for approximately one to two days per turbine site.

Equipment will include, at a minimum, trucks, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below.

5.2.2.5 Delivery of Equipment

Equipment will be delivered by truck and trailer throughout the construction phase and stored at the temporary laydown sites surrounding each turbine. A Road Use Agreement and Traffic Management Plan will be developed in consultation with the municipalities. Alternative traffic routes will be prepared to address traffic congestion, as needed. To the extent necessary, modifications to public roads will be addressed in the Road Use Agreement.

5.2.2.6 Construction of Turbine Foundations

A backhoe will be used to excavate an area approximately 3 m deep x 20 m x 20 m with the material being stockpiled for future backfilling. Stockpiled material will have topsoil and subsoil separated out and surplus excavated material will be removed from the site for disposal in an approved manner. The foundation, with an approximate footprint of 400 m², will be constructed of poured concrete and reinforced with steel rebar to provide strength. The construction timeframe for turbine foundations is three to four days, excluding curing time. After construction the foundation will be backfilled and the surface will be landscaped for drainage. The only surface evidence of the foundation will be a small protrusion of concrete to which the tower is attached; as such land can be cultivated to within a few metres of the turbine. Any wood-waste generated will be removed from the site and recycled unless the landowner otherwise directs. Spent welding rods will be disposed of as hazardous waste by a licensed contractor.

Typical construction equipment, on a per turbine basis, will include:

- Excavator for removing material;
- Flatbed trucks (four to six) for delivery of rebar, turbine mounting assembly and forms;
- Truck mounted crane or rough terrain forklift for unloading and placement of rebar and forms;
- Concrete trucks for delivery of concrete (30 to 40 loads);
- Construction trucks (three to four vehicles with multiple visits); and,
- Dozer, loader and trucks to backfill and compact foundation and remove surplus excavated materials.

The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below.

5.2.2.7 *Wind Turbine Assembly and Installation*

Turbine components will arrive on-site using flat bed and other trucks and will be temporarily stored on-site in the immediate vicinity of the base prior to assembly. Typically two cranes will be used to install the turbines. The larger crane is usually a crawler type with a capacity of 400 tonnes or larger, and is used for the higher lifts.

Clearing and grubbing will be required for the erection area. The erection cranes and crew will follow the foundation crew and erect the wind turbines once the foundations are completed and the concrete has cured. This will typically be in five lifts (three for the towers, one for the nacelle and one for the rotor) over a period of two to three days. The lower tower sections may be installed several days before the upper tower sections and the turbine to optimize installation sequence. The lower tower section will also include electrical and communications equipment. Total turbine assembly and installation will typically require four to five days for each turbine. Fifteen to twenty people may be required at the site during the turbine installation; they will be transported using light duty vehicles.

Packing frames for the turbine components are returned to the turbine vendor. Following commissioning, the surrounding area will be returned to its original condition.

Equipment will include, at a minimum, trucks, two cranes, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The larger track mounted crane can move from turbine site to turbine site; however, it will need to be disassembled to move it along roadways and from the Project site. Alternatively, cranes may be moved between turbine sites without disassembly along crane paths (crane paths will not require temporary or permanent infrastructure). In such instances, no additional infrastructure is required to support the crane movement. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below.

5.2.2.8 *Construction of Electrical Collector System*

The electrical collector system will consist of pad mounted transformers and underground collection lines. These components are described below.

- **Pad Mount Transformers:**
A concrete transformer pad, approximately 2.2 m by 2.5 m in size, will be installed adjacent to each turbine at the same time as the turbine base installation. The construction will consist of excavation, soil storage, installation of the buried electrical grounding grid, installation of the concrete pad, installation of the transformer, and electrical connections. Transformer installation and cabling between the turbine and

transformer is expected to take three days per turbine. Equipment will include flatbed trucks to transport the equipment to site, and a truck-mounted crane for the installation. These activities will likely require four to six trucks, a work force of two people per vehicle per day, and will last between four to six days per turbine.

- **Collection Lines:**

Cables and fibre optics lines (for communications) from each turbine to the transformer substation will be buried and will be located on private property or within municipal road right of ways. There may be occasional locations where the collection lines are placed above ground on wood, concrete or steel poles. Above ground junction boxes will be installed to connect sections of underground cabling. There will be a 20 m wide area for construction of the collection lines. The collection lines will be sited within this area of disturbance in consultation with the landowner and taking into consideration potential environmental effects. The excavated soil will be stored temporarily and then reused as backfill. Power conductors will be approximately 0.9 m below grade and the location will be marked. Equipment will include trenchers or diggers (depending on soil type) and construction will require a crew of six people. The construction timeframe is dependent upon the required length of the lines.

- **Horizontal Directional Drilling:**

Electrical cables may need to be installed using horizontal directional drilling to minimize effects to woodlots or watercourses. Erosion control devices will be installed at the drill location and drill cuttings will be collected and removed from the site for disposal in an approved and appropriate manner. An entrance and exit pit will be excavated on either side of the feature to be bored under. The directional drilling equipment will be set up at the entrance pit and a drill bit attached to rod segments is advanced until it reaches the exit pit. A slurry of bentonite and/or polymer mixed with water will be injected into the hole while drilling to help stabilize the bore hole and reduce friction. Once the drill bit has reached the exit pit the drill bit will be removed and a “reamer” attached and pulled back through the hole to enlarge the bore. The electrical cable will then be installed through the hole. Equipment will include a directional drilling rig and two to three support trucks to carry drilling rods, drilling supplies and cable.

Chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment, and the polymer used for directional drilling.

5.2.2.9 *Construction of Electrical Transmission Line*

Holes for new transmission line poles are typically augured in the ground using a truck mounted auger device. The poles will then be inserted using special cranes to a typical depth of 2 m to 3 m below grade. The poles are typically “dressed” (made ready to accept conductors) on the ground prior to installation. In locations where the transmission line makes a turn, guy wires may be used to anchor the corner pole in place. At times, when guy wires cannot be used at corner poles, the steel poles may be mounted on concrete pier foundations. Typically, one crew will install the poles and one crew will dress them. Approximately six construction vehicles (including trucks and a pole loader) and a crew of 12 to 15 people are anticipated for construction of the transmission lines. A maximum of twelve to sixteen poles can be installed and dressed in one day. Once the poles are in place and dressed, cables will be strung in place using boom trucks and special cable reel trucks. Finally, any pre-existing poles that are no longer in use will be removed.

The transmission line will be directionally drilled in one location to avoid affecting a Provincially Significant Wetland. Construction will follow the same process described in Section 5.2.2.8 for directionally drilling the collector system.

Some packing-material waste may be generated from construction. All recyclable materials will be separated from non-recyclable materials and both streams will be removed from the site and disposed of at an approved and licenced facility.

Equipment will include, at a minimum, a truck mounted crane, a drill rig, flatbed trailers and a truck mounted auger. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below.

5.2.2.10 Construction of Transformer Substation and Breaker Switch Station

During construction of the substation and breaker, topsoil and subsoils will be stripped and stockpiled separately. Stripped topsoil and subsoil will be placed in the temporary storage facility area and topsoil stripped from the substation area will be distributed on other Project properties. An electrical service line will connect to the existing distribution line adjacent to the substation for the purpose of providing house service power to the substation control building. The construction crew will consist of approximately 25 to 40 people and construction is expected to last for about four months. Some packing-material waste may be generated. All recyclable materials will be separated from non-recyclable materials and both streams will be removed from the site and disposed of at an approved and licensed facility.

Construction equipment will include small trenchers, a small crane, a backhoe, forklifts, concrete trucks and a bulldozer. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment and transformer oil. Fuel-handling will be conducted in compliance with the mitigation measures outlined below.

5.2.2.11 Construction of Operation and Maintenance Building

Construction of the operations building may take up to three months to complete and will require a crew of approximately 10 to 15 people.

Equipment will include, at a minimum, forklifts, concrete trucks and smaller crew trucks. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below.

5.2.2.12 Permanent Meteorological Towers

The towers will be erected using winches and secured with guy wires tied off to anchors or a monopole foundation. No significant soil or vegetation disturbance is anticipated. Construction of each meteorological tower will take approximately two days and require a crew of six people.

5.2.2.13 Clean-up and Reclamation

Site clean-up will occur throughout the construction phase and site reclamation will occur after construction has been completed. Waste and debris generated during the construction activities will be collected by a licensed operator and disposed of at an approved facility. All reasonable efforts will be made to minimize waste generated and to recycle materials including returning packaging material to suppliers for reuse/recycling.

Stripped soil will be replaced and re-contoured in the construction areas to reflect pre-construction topography, except around the base of turbines where contouring will allow for drainage (refer to Section 5.2.2.6). Disturbed

areas will be re-seeded, as appropriate. In some locations, buffer areas will be re-vegetated using a native seed mix, as described in Section 5.5. Erosion control equipment will be removed once inspections have determined that the threat of erosion has diminished to the original land use level or lower. High voltage warning signs will be installed at the transformer substation and elsewhere, as appropriate. At the conclusion of construction vehicles and construction equipment will be removed from the site.

5.2.2.14 Turbine Commissioning

Turbine commissioning will occur once the wind turbines and substation are fully installed and Hydro One is ready to accept grid interconnection. The commissioning activities will consist of testing and inspection of electrical, mechanical and communications systems. Some packing-material waste may be generated. All recyclable materials will be separated from non-recyclable materials and both streams will be removed from the site and disposed of at an approved and licenced facility.

Temporary portable generator sets may be used to electrically commission the turbines prior to connection to the grid. The generators will be required for approximately one day per turbine. Following the commissioning phase, the portable generators will be removed from the site and returned to the owners.

Equipment will include support trucks which will be driven to the construction site. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment and portable generators, gearbox oil, and lubricants. Fuel-handling will be conducted in compliance with the mitigation measures outline below.

5.3 Overview of Potential Negative Environmental Effects

The preferred method for the management of potential environmental effects is through the avoidance of significant natural features during the Project planning and layout design process. Alternatives for conducting the proposed activity were considered during the planning stages of the proposed Goshen Wind Energy Centre in order to avoid adverse effects to significant natural features to the extent possible, while working within other constraints including noise, lease agreements and landowner preference. Alterations to the proposed layout occurred throughout Project development as significant natural features were identified, including relocation of Project infrastructure away from sites that support sensitive species and their habitats, applying setbacks to significant natural features, and implementing directional drilling techniques to avoid above-ground disturbance to significant natural features. Mitigation measures and monitoring commitments to address potential effects that may occur where avoidance was not possible are described in this EIS.

Construction activities within 120 m of significant natural features may result in accidental intrusion causing physical damage to vegetation, increased erosion and sedimentation, disturbance to local wildlife through noise or mortality, risk of soil or water contamination, windblown dust and changes in natural drainage patterns. These potential effects are anticipated to be avoided or minimized through the application of the mitigation measures described below.

A general discussion of additional potential negative environmental effects specific to different types of project infrastructure is provided below.

5.3.1 Potential Effects of Turbines

The Natural Heritage Assessment process focuses on the consideration and protection of Significant Wildlife Habitats during the Project planning and layout design process. This habitat-based approach is a key factor in preventing negative effects on birds and bats for this Project (MNR, 2011g; MNR, 2011h). Alterations to the

proposed Goshen Wind Energy Centre were made during the planning and layout design stages of this Project to avoid Significant Wildlife Habitat and other significant natural features to the extent possible, while working within other constraints. All turbines and associated laydown areas in the Goshen Wind Energy Centre will be located within agricultural fields. Therefore, no direct loss or fragmentation of significant natural features is expected as a result of turbine installations.

In North America, wind turbines present less of a danger to birds than other anthropogenic sources of mortality such as buildings or roads (Erickson, *et al.*, 2001). However, birds and bats may be injured or killed through collisions with moving turbine blades, and air pressure changes near moving turbine blades may also result in bat mortality. On the basis of bird mortality monitoring results from Ontario wind power projects, the MNR has concluded that mortality resulting from wind turbines is not considered to be a concern for most of Ontario's bird populations (MNR, 2011h). Bat mortality rates vary widely across wind power projects (MNR, 2011g).

Potential effects of the proposed Project on birds and bats are addressed through the Environmental Effects Monitoring Plan (EEMP), as described in the Goshen Design and Operation Report (AECOM, 2012c). Mitigation measures are proposed in Section 5.8 of this report to minimize adverse effects to birds and bats through avoidance behaviour or disturbance caused by noise or lighting during turbine operation.

5.3.2 Potential Effects of Access Roads

Access roads will be constructed in existing agricultural fields and outside significant natural features. Therefore, no direct loss or fragmentation of significant natural features is expected as a result of access road construction. The roads do not require removal of natural vegetation except for portions of some hedgerows or treerows between agricultural fields.

Access roads may result in wildlife mortality through direct collision with vehicular traffic or act as barriers to wildlife movement during operation; however these effects are anticipated to be minimal given the limited volume of maintenance vehicles. Refer to Section 5.8 for potential effects and proposed mitigation measures.

5.3.3 Potential Effects of Underground Collection Lines

No direct loss or fragmentation of significant natural features is expected as a result of collection line construction. Collection lines will be installed along access roads or existing road rights-of-way where feasible. Where collection lines cross a significant natural feature, the lines will be directionally drilled underneath; thereby no intrusion or vegetation removal will be required. The drilling equipment and the entrance and exit pits will be located 30 m away from the edge of the feature.

There are nine locations where collection lines will be installed via horizontal directional drilling underneath significant natural features. The feature numbers where directional drilling is required, and the approximate width of the feature under which drilling will occur, are listed below:

- Natural area 177 (width 82 m) significant woodland (WOD-001) and significant wetland (WET-006);
- Natural area 198 (width 21 m) significant woodland (WOD-018) and significant wetland (WET-014);
- Natural area 210 (width at two locations 49 m and 122 m) significant woodland (WOD-032) and significant wetland (WET-014);
- Natural area 216 (width 20 m) significant woodland (WOD-034) and significant wetland (WET-014);
- Natural area 236 (width 128 m): significant woodland (WOD-054) and significant wetland (WET-010);

- Natural area 267 (width 49 m): significant woodland (WOD-101) and significant wetland (WET-032);
- Natural area 282 (width 59 m): significant woodland (WOD-133);
- Natural area 309 (width 139 m): significant woodland (WOD-191) and significant wetland (WET-021); and,
- Natural area 375 (WOD-313 and WET025) significant woodland and significant wetland, width 222 m.

The potential effects to the features listed above will be avoided, minimized, or compensated for through the application of mitigation measures. Specifically, the mitigation measures described in Sections 5.5, 5.6 and 5.8 address potential effects of horizontal directional drilling. Such effects may include the escape of drilling mud containing bentonite or polymer into the environment as a result of a spill, tunnel collapse or the rupture of mud to the surface in the event of a “frac-out”, which can adversely affect natural features through soil and/or water contamination. To avoid a “frac-out” while directionally drilling beneath a significant natural feature, drilling depth will be determined based on site-specific geotechnical conditions, taking into account soil type, soil variances and porosity, as derived from exploratory borehole information.

Collection line installation is proposed within existing road right-of-ways in locations throughout the Project Study Area, at times between an existing road and significant natural features and within the dripline of trees. Locating crossings of significant natural features within existing road right-of-ways is often the preferred alternative for avoiding or limiting negative effects to these features, given that these locations are typically already disturbed by the existing road and subject to routine maintenance associated with the road. Mitigation measures to address potential effects of construction activities where collection lines will be installed adjacent to significant natural features are also described below.

5.3.4 Potential Effects of the Transmission Line

One transmission line is proposed for the Goshen Wind Energy Centre. The location of the proposed transmission line is shown on Figure 1.2. This discussion of the effects arising from the transmission line assumes that vegetation removal for construction of the transmission line will occur within the disturbance area as mapped in this report (between 20 m and 61 m in width), with the exception of the transmission line crossing of wetland feature WET-012, which overlaps with a significant valleyland (VAL-02) and significant woodland features WOD-104 and WOD-109. At this location, the transmission line will be installed beneath wetland feature WET-012 via horizontal directional drilling.

Vegetation removal is planned for transmission line construction within significant natural features in four locations. The natural area and feature numbers where vegetation removal is proposed and the area of the feature within which vegetation removal will occur are listed below:

- Natural area 648 (up to 0.25 ha): significant woodland (WOD-120), bat maternity colony (BMC-648) and amphibian woodland breeding habitat (AWO-35);
- Natural area 662 (up to 0.4 ha): significant woodland (WOD-134);
- Natural area 721 (up to 1.0 ha): significant woodland (WOD-180) and amphibian woodland breeding habitat (AWO-34); and,
- Natural area 720 (up to 1.0 ha): significant woodland (WOD-200), bat maternity colony (BMC-720), amphibian woodland breeding habitat (AWO-33), and habitat for bird species of conservation concern (Red-headed Woodpecker) (SCB-03).

The potential effects to the features listed above will be avoided, minimized or compensated for through the application of mitigation measures. Potential effects of vegetation removal in significant woodlands include the loss of forest cover, creating forest fragmentation, and increasing the amount of forest edges including an increase in invasive weed cover along forest edges. This loss of forest area and fragmentation may have a negative effect on the habitat suitability of the woodland for plant and wildlife species. Vegetation removal in natural areas identified as Significant Wildlife Habitat may displace bats, amphibians or bird species of conservation, or disturb the natural areas such that they become less suitable or unsuitable as habitat for these species. Refer to Sections 5.6 and 5.8 for a more detailed description of potential effects and proposed mitigation measures.

5.3.5 Potential Effects of the Substation, Operations Building, Construction Laydown Yard and Meteorological Towers

The proposed operations building, substation, construction laydown yard and meteorological towers are located outside of any significant natural features, therefore no direct impacts to these features area anticipated. Mitigation measures to address potential effects of site preparation, grading and construction activities where these Project components will be installed adjacent to significant natural features are described below.

5.4 Overview of Proposed Mitigation Measures

A summary of the general mitigation measures recommended for the construction, operation and decommissioning of all Project infrastructure is provided below. Mitigation measures to address potential negative effects on specific significant natural features are presented in Sections 5.5 to 5.8.

1. Construction Timing

- Schedule vegetation removal to occur outside the breeding bird period (May 1 to July 31). Undertake active nest surveys prior to construction if clearing of vegetation must take place during this period.

2. Natural Areas Protection

- Align project component such that vegetation removal is kept to a minimum and limited to non-significant habitats (e.g., hedgerows), where possible.
- For roadside collection line and transmission line routes, vegetation removal (if any) will be kept to a minimum and will be limited to the road right-of-way, where possible. Additional mitigation measures will be applied where vegetation removal will occur in significant natural features (*i.e.*, natural areas 648, 662, 721 and 720), as described in Sections 5.6 and 5.8 below.
- Where construction is to occur within 30 m of a naturally vegetated feature (*i.e.*, woodland, wetland, etc.), install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation or intrusion into the natural feature.
- Prune any trees damaged during construction through implementation of proper arboricultural techniques.
- Only apply herbicides (if required) when wind speeds are low and no significant precipitation is expected (does not apply to agricultural practices).
- Only use herbicides (if required) approved for use adjacent to water bodies, riparian buffers, or woodland edges (does not apply to agricultural practices).
- Where excavation for construction of access roads or collection lines is conducted adjacent to the dripline of woodlands (or within the dripline for collection line installation within road right-of-ways), implement proper root pruning measures to protect tree roots.

3. Erosion and Sediment Control

- Develop and implement an erosion and sediment control plan before commencement of construction.
- Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. for construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (*i.e.*, heavy duty silt fencing, straw bales).
- Check that sediment and erosion controls are in good repair and properly functioning prior to conducting daily work and re-install or repair as required prior to commencing daily construction activities. Check sediment and erosion controls before and after significant rainfall events to ensure they are effective.
- Keep sediment and erosion control measures in place until disturbed areas have been stabilized (*i.e.*, re-vegetated).
- To avoid sedimentation in wetlands and watercourses, schedule grading within 30 m of a watercourse or wetland to avoid times of high runoff volumes, wherever possible. Temporarily suspend work if high runoff volume is noted or excessive flows of sediment discharges occur until contingency measures are in place.
- Re-vegetate temporary disturbance areas (*i.e.* roads, laydown areas, etc.) to pre-construction conditions as soon as possible after construction activities are complete using species native to the area in naturally vegetated areas.

4. Equipment Use

- Ensure machinery is maintained free of fluid leaks.
- Where feasible, light vehicles with wide tires having a large surface area (rather than tracked vehicles) and lighter machinery (*e.g.* hand-held equipment) should be used in and around natural areas.
- Any vehicles used within natural areas should use wide-based tires. Tracked vehicles should be avoided.
- Locate site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features or water bodies. Use spill collection pads for vehicle refuelling and maintenance.

5. Grading and Excavation

- Minimize changes in land contours and natural drainage; maintain timing and quantity of flows. Any grading of lands adjacent to natural heritage features should match existing grades at the identified set-back, or buffer from the features.

6. Material Stockpiling and Handling

- Control soil / water contamination through best management practices, including:
 - Store any stockpiled materials at least 30 m away from a wetland, woodland or water body to prevent deleterious substances from inadvertently discharging to the environment;
 - Develop a spill response plan and train staff on associated procedures;
 - Maintain emergency spill kits on site; and,
 - Dispose of any waste material from construction activities by authorized and approved off-site vendors.

7. Horizontal Directional Drilling

- Conduct all drilling by licensed drillers in accordance with Regulation 903 under *Ontario Water Resources Act*, R.S.O. 1990.
- Set back drill entry and exit pits at least 30 m from natural features (i.e., woodlands, wetlands) or water bodies.
- Collect drill cuttings as they are generated and place in a soil bin or bag for off-site disposal.
- Ensure drill depth is at an appropriate depth below natural features to reduce the risk of a “frac-out”¹. Drilling depth will be determined based on site-specific geotechnical conditions and will take into account soil type, soil variances and porosity, as derived from exploratory borehole information.
- Monitor natural features for signs of surface disturbance (e.g., escape of drilling mud, evidence of tunnel collapse).
- Implement a Frac-out Contingency Plan in the event of a “frac-out”, which will include but is not limited to the following:
 1. Immediately stop all work, including the recycling of drilling mud / lubricant;
 2. Isolate affected watercourse or area using a temporary dam and install by-pass pump system (if required) to maintain continuous flow downstream of the site;
 3. Insert rigid in-water/soil containment unit or underwater boom into the “frac-out” source area in order to contain any sediments and/or deleterious materials originating from the “frac-out”;
 4. No captured material will be left on-site. The captured material will be extracted by vacuum truck, if available, or pumped into a containment unit or area for off-site disposal;
 5. Monitor “frac-out” for 4 hours to determine if the drilling mud congeals. If drilling mud congeals, take no other action that would potentially suspend sediments in the water column. If drilling mud does not congeal, maintain isolation/containment unit in place and continue pumping captured material to a containment unit or area until drilling mud congeals or stops flowing;
 6. Notify the Ministry of the Environment’s (MOE) Spills Action Centre (1-800-268-6060) of the “frac-out” event and the response taken to contain the spill. This step will be completed during the 4 hour “frac-out” monitoring period;
 7. Engage a spill response team to contain and clean up excess drilling mud in the water;
 8. Monitor clean-up procedures to ensure they do not result in greater damage than leaving the mud in-place;
 9. If the spill affects an area that is vegetated, the area will be seeded and/or replanted using the same species to those in the adjacent area, or allowed to re-grow from existing vegetation. Revegetated areas will be monitored once per growing season for two years subsequent to “frac-out” to confirm re-vegetation is successful; and,
 10. Document post-cleanup conditions with photographs and prepare a “frac-out” incident report describing time, place, actions taken to remediate “frac-out” and measures implemented to prevent recurrence. Provide incident report to MNR and MOE within 30 days of the incident.

8. Wildlife Protection

- Clearly post construction speed limits (30km/h). Install and maintain wildlife crossing and speed limit signs on access roads.
- Locate Project components outside of natural features to avoid direct impacts to wildlife habitat, where possible.

1. *Escape of drilling mud into the environment as a result of a spill, tunnel collapse or the rupture of mud to the surface.*

- Schedule vegetation removal to occur outside the breeding bird period (May 1 to July 31). Undertake active nest surveys prior to construction if clearing of vegetation must take place during this period.
- Only apply herbicides (if required) when wind speeds are low and no significant precipitation is expected (does not apply to agricultural practices).
- Only use herbicides (if required) approved for use adjacent to water bodies, riparian buffers, or woodland edges (does not apply to agricultural practices).

9. Dewatering activities (if necessary)

- Control rate and timing of water pumping.
- Pump from deep wells to infiltration galleries adjacent to water bodies or wetlands.
- Restrict taking of water during periods of extreme low flow.
- Install a temporary storage basin to allow water to infiltrate.

10. Impervious Surfaces

- Maintain vegetative buffers around water bodies, including wetlands.
- Control quantity and quality of stormwater discharge using best management practices (e.g., use of a permeable surface for access roads, complete a Stormwater Pollution Prevention Study to address any potential effects associated with stormwater runoff for the Operations and Maintenance Building prior to construction).

5.5 Significant Wetlands

This section describes potential negative environmental effects of the proposed Project on significant wetlands, as defined in the Natural Heritage Assessment Guide, during the construction, operational and decommissioning phases. Details regarding how the Construction Plan and Environmental Effects Monitoring Plan address these potential negative effects, including mitigation measures, performance objectives, monitoring methods and contingency measures, are also described herein.

A total of 14 wetland complexes treated as significant wetlands and assessed under Appendix C of the Natural Heritage Assessment Guide have been identified within the Goshen Wind Energy Centre Project Study Area (Figure 3.3). These wetlands are referred to as “significant wetlands” herein and are treated as Provincially Significant, although complete OWES evaluations have not been undertaken to confirm the significance of wetlands in or within the 120 m Area of Investigation. No above-ground project infrastructure (including turbines, access roads, collection lines, transmission line, meteorological towers, operations and maintenance building, or transformer substation) is located within significant wetlands and no vegetation clearing will be required in significant wetlands to accommodate the proposed Project. As a result, there will be no direct loss or fragmentation of significant wetlands.

Where construction of access roads or disturbance areas associated with turbine construction are proposed in agricultural fields adjacent to significant wetlands, a minimum 30 m buffer from the wetland edge will be applied, where possible, in which no physical disturbance will be permitted. This buffer will mitigate potential negative environmental effects associated with construction of turbines, and with construction and operation of access roads.

Through correspondence with MNR, a protocol was developed and applied to assess the current land use and slope at all locations where construction of turbines or access roads are proposed within 30 m of a significant wetland to determine whether a larger (*i.e.*, 30 m) setback is warranted. In all locations where construction of turbines or access roads is proposed within 30 m of a significant wetland, agricultural lands (*i.e.*, lands outside the natural area boundaries) within the buffer area are currently under intensive agricultural use. These areas are therefore already

disturbed as a result of agricultural activities which include ploughing and other farming practices. An analysis of topographic mapping (1 m contour intervals) was also undertaken to determine whether the land surface slopes toward wetland features where construction activities are proposed within 30 m. There is one location where there is a greater than 5% slope toward a wetland feature, WET-21 (in natural area 274). In this location, a collection line is proposed 5 m from the feature, at a slope of 5.25%, and is located in the right-of-way of Kirkton Road. On the basis of this assessment, this setback (measured from the dripline of trees, where applicable) was determined to be sufficient to address potential negative effects to wetlands, given that the right-of-way of an existing road is generally the preferred location for crossings of significant wetlands. Where construction activities will occur within 30 m of a wetland, construction mitigation measures will include sediment and erosion controls as described in Table 5.2 below. Additional mitigation measures, including the establishment of a vegetated buffer, are to be implemented where the minimum 5 m setback is applied during construction of access roads.

Collection lines and the transmission line will be installed under seven significant wetlands via horizontal directional drilling (collection lines: WET-006, WET-010, WET-014, WET-021, WET-025, WET-032; transmission line: WET-012). In order to avoid impacts to significant wetlands associated with directional drilling, entrance and exit pits will be located a minimum of 30 m away from significant wetlands and no physical disturbance within the 30 m buffer will be permitted. This buffer will mitigate potential negative environmental effects associated with use of equipment and machinery for the installation of collection and transmission lines, including accidental intrusion into natural areas, sedimentation and erosion, and risk of soil or water contamination in wetlands from accidental spills of fuel. Additional mitigation measures specific to the underground installation of collection and transmission lines (*i.e.*, “frac-out” response plan), are described in Section 5.4 of this report and in Table 5.2 below. The wetland features where directional drilling is required, and the approximate distances of significant wetlands under which drilling will occur, are listed below:

- WET-006: distance 82 m;
- WET-010: distance 127 m;
- WET-012: distance 141 m;
- WET-014: distance in three locations 49 m, 20 m and 122 m;
- WET-021: distance 139 m;
- WET-025: distance 222 m; and
- WET-032: distance in two locations 50 m and 59 m.

Potential residual effects of construction activities on significant wetlands may occur through grading and subsequent changes in surface water flow patterns and/or local hydrology (refer to Section 5.2.2 for a description of construction activities). These changes could potentially affect hydrologic conditions (*i.e.*, soil moisture) which may lead to potentially adverse changes in vegetation community composition. Other potential residual effects on significant wetlands may occur through construction or operational activities that could result in noise disturbances to wildlife, mobilization of dust, or sedimentation and erosion. These potential residual effects are expected to be short-term and temporary in duration and can be mitigated with the application of specified control measures (refer to Table 5.2 below).

The significance of anticipated residual effects is low provided that the recommended mitigation measures (as described in Table 5.2 below) are properly implemented and proactively managed throughout the duration of construction and post-construction activities.

5.5.1 Mitigation Measures

Mitigation measures to address potential negative environmental effects of Project construction, operation and decommissioning on significant wetlands are presented in Table 5.2. This table describes the potential negative environmental effects, performance objectives, mitigation measures, monitoring plans, and contingency measures to be used should monitoring show that further action is required, as they relate to significant wetlands located within 120 m of the proposed Project.

Table 5.2 Potential Effects on Significant Wetlands and Mitigation Measures

Significant Wetland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
Wetlands within 5 m of Project Infrastructure WET-006: >0.1 m (access road) WET-010: 3 m (collection line) WET-011: >0.1 m (access road) WET-012: >0.1 m (transmission line) WET-014: >0.1 m (collection line) WET-019: >0.1 m (collection line) WET-021: >0.1 m (collection line) WET-032: >0.1 m (collection line) WET-053: >0.1 m (transmission line)	Construction/Decommissioning <ul style="list-style-type: none"> Accidental intrusion into significant wetlands resulting in damage to wetland form or function. 	<ul style="list-style-type: none"> Avoid accidental intrusion into significant wetlands. 	<ul style="list-style-type: none"> Maintain 30 m setback from significant wetlands, where possible, or a minimum 5 m setback (measured from the dripline of trees or wetland edge if trees are absent). Limit vegetation removal for the transmission line to the existing road right-of-way. Establish 30 m setback to significant wetlands from new transmission line pole locations, where possible. Where construction occurs within 30 m, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation. 	<ul style="list-style-type: none"> Accidental intrusion will be avoided through clear delineation of boundaries and protective fencing. Negligible residual effects. 	<ul style="list-style-type: none"> Undertake weekly site inspection by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. Contingency Measures: <ul style="list-style-type: none"> Repair protective fencing if damaged. Any damaged trees will be pruned through the implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. If any wetland vegetation is damaged, habitat restoration will occur utilizing suitable native species.
	<ul style="list-style-type: none"> Risk of soil or water contamination resulting from accidental spills of fuel, etc. 	<ul style="list-style-type: none"> Minimize soil or water contamination. 	<ul style="list-style-type: none"> Develop and implement emergency spills plan outlining steps to contain any chemicals or to avoid contamination of adjacent wetland features. Refer to General Mitigation Measures (Section 5.4). 	<ul style="list-style-type: none"> Soil and water contamination avoided or minimized. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Contractor to conduct routine inspections of construction equipment for leaks / spills. Develop an emergency spills plan. Contingency Measures: <ul style="list-style-type: none"> In the event of a spill, immediately stop all work until the spill is cleaned up. Notify MOE's Spills Action Centre of any leaks or spills. If a spill enters a wetland, collect and analyze water samples for appropriate parameters. Monitor daily until cleanup is completed.
	<ul style="list-style-type: none"> Increased dust accumulation on peripheral wetland vegetation, causing damage to wetland plants. 	<ul style="list-style-type: none"> Minimize dust accumulation on peripheral vegetation. 	<ul style="list-style-type: none"> Use water as a dust suppressant within the construction footprint along areas where construction is located within 5 m of a significant wetland. 	<ul style="list-style-type: none"> Accumulation of dust on peripheral vegetation avoided or minimized. Some residual effects of limited magnitude likely. 	<ul style="list-style-type: none"> Daily monitoring of areas where active construction is occurring within 5 m of a significant wetland by an Environmental Monitor. Contingency Measures: <ul style="list-style-type: none"> If dust accumulation on wetland plants occurs, spray down plants with water.
	<ul style="list-style-type: none"> Changes in surface water drainage patterns resulting in effects to soil moisture and species composition of vegetation. 	<ul style="list-style-type: none"> Minimize effects to soil moisture and species composition of vegetation. 	<ul style="list-style-type: none"> Ensure Best Management Practices are used to maintain current drainage patterns, including: <ul style="list-style-type: none"> Implement infiltration techniques to the maximum extent possible. Minimize paved surfaces and design roads to promote infiltration. Limit changes in land contours. 	<ul style="list-style-type: none"> Effects to soil moisture and species composition of vegetation minimized. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Site inspection by Environmental Monitor following grading activities within 30 m of significant wetlands. Contingency Measures: <ul style="list-style-type: none"> If surface water drainage alterations are detected, undertake corrective measures to restore drainage patterns.

Table 5.2 Potential Effects on Significant Wetlands and Mitigation Measures

Significant Wetland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<ul style="list-style-type: none"> Increased erosion and sedimentation resulting from clearing and grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Minimize erosion and sedimentation from clearing, grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Maintain 30 m setback from significant wetlands, where possible, or a minimum 5 m setback (measured from the dripline of trees or wetland edge if trees are absent). Install sediment and erosion control fencing along edge of construction area if within 30 m of a wetland as per Ontario Provincial Standards Specifications (OPSD 219.130). Refer to General Mitigation Measures (Section 5.4). 	<ul style="list-style-type: none"> Increased sedimentation and erosion avoided or minimized through the application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Monitor on-site conditions (<i>i.e.</i>, erosion and sediment control, flooding, etc.) where construction occurs within 5 m of a feature by an Environmental Monitor on the following basis: <ul style="list-style-type: none"> Daily during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (<i>i.e.</i>, spring freshet); Daily during extended rain or snowmelt periods; Monthly during inactive construction periods, where the site is left alone for 30 days or longer. Contingency Measures: <ul style="list-style-type: none"> Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place (e.g. installation of extra erosion and sediment control materials kept on site such as silt fencing, straw bales, etc.).
	<p>Operation</p> <ul style="list-style-type: none"> Risk of soil or water contamination from oil, gas, etc. during maintenance activities where access roads, turbines or the transmission line are within 30 m of significant wetlands. 	<ul style="list-style-type: none"> No off-site contamination of soil or no contamination of groundwater or surface water. 	<ul style="list-style-type: none"> Develop and implement an emergency spills plan outlining steps to contain any spills during maintenance activities to avoid contamination of significant wetlands. 	<ul style="list-style-type: none"> Residual effects considered negligible. 	<ul style="list-style-type: none"> No monitoring required. Contingency Measures: <ul style="list-style-type: none"> Report the details of the spill to MOE, including a description of any assessment and remediation undertaken.
	<ul style="list-style-type: none"> Potential introduction of invasive species into wetland communities adjacent to access roads. 	<ul style="list-style-type: none"> Minimize species invasion into wetland communities. 	<ul style="list-style-type: none"> Develop and implement a restoration plan to re-vegetate the 5 m buffer between the access road and the wetland. This will include the 1 year application of an approved herbicide (as per Ausable Bayfield Conservation Authority) to eradicate invasive species followed by seeding with a native seed mix and the planting of native shrubs along the edge consistent with existing vegetation composition. 	<ul style="list-style-type: none"> Introduction of invasive species avoided or minimized through the application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Monitor re-vegetated areas once per growing season for two years to confirm survival of plantings and/or seed mix. Contingency Measures: <ul style="list-style-type: none"> Should seed mix and/or plantings not survive, additional seeding and/or plantings will be undertaken.

Table 5.2 Potential Effects on Significant Wetlands and Mitigation Measures

Significant Wetland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
Wetlands 5 m to 30 m from Project Infrastructure WET-025: 16 m (access road) WET-049: 13 m (turbine construction footprint)	Construction/Decommissioning <ul style="list-style-type: none"> Accidental intrusion into significant wetlands resulting in damage to wetland form or function. 	<ul style="list-style-type: none"> Avoid accidental intrusion into significant wetlands. 	<ul style="list-style-type: none"> Maintain 30 m setback from significant wetlands, where possible, or a minimum 5 m setback (measured from the dripline of trees or wetland edge if trees are absent). Where construction occurs within 30 m, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation. 	<ul style="list-style-type: none"> Accidental intrusion will be avoided through clear delineation of boundaries and protective fencing. Negligible residual effects. 	<ul style="list-style-type: none"> Undertake weekly site inspection by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. Contingency Measures: <ul style="list-style-type: none"> Repair protective fencing if damaged. Any damaged trees will be pruned through the implementation of proper arboricultural techniques, under supervision or an Arborist or Forester. If any wetland vegetation is damaged, habitat restoration will occur utilizing suitable native species.
	<ul style="list-style-type: none"> Increased erosion and sedimentation resulting from clearing and grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Minimize erosion and sedimentation from clearing, grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Maintain 30 m setback from significant wetlands, where possible, or a minimum 5 m setback (measured from the dripline of trees or wetland edge if trees are absent). Install sediment and erosion control fencing along edge of construction area if within 30 m of a wetland as per Ontario Provincial Standards Specifications (OPSD 219.130). 	<ul style="list-style-type: none"> Increased sedimentation and erosion avoided or minimized through the application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Monitor on-site conditions (i.e., erosion and sediment control, flooding, etc.) by an Environmental Monitor where construction occurs within 5 m to 30 m of a feature on the following basis: <ul style="list-style-type: none"> Weekly during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (i.e., spring freshet); Daily during extended rain or snowmelt periods; Monthly during inactive construction periods, where the site is left alone for 30 days or longer. Contingency Measures: <ul style="list-style-type: none"> Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place (e.g. installation of extra erosion and sediment control materials kept on site such as silt fencing, straw bales, etc.).
	<ul style="list-style-type: none"> Risk of soil or water contamination resulting from accidental spills of fuel, etc. 	<ul style="list-style-type: none"> Minimize soil or water contamination. 	<ul style="list-style-type: none"> Develop and implement emergency spills plan outlining steps to contain any chemicals or to avoid contamination of adjacent wetland features. Refer to General Mitigation Measures (Section 5.4). 	<ul style="list-style-type: none"> Soil and water contamination avoided or minimized through the application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Contractor to conduct routine inspections of construction equipment for leaks / spills. Develop an emergency spills plan. Contingency Measures: <ul style="list-style-type: none"> In the event of a spill, immediately stop all work until the spill is cleaned up. Notify MOE's Spills Action Centre of any leaks or spills. Assess and remediate affected soils and water by using spill kit kept on site; If a spill enters a wetland, collect and analyze water samples for appropriate parameters. Monitor daily until cleanup is completed.
	<ul style="list-style-type: none"> Changes in surface water drainage patterns resulting in effects to soil moisture and species composition of vegetation. 	<ul style="list-style-type: none"> Minimize effects to soil moisture and species composition of vegetation. 	<ul style="list-style-type: none"> Ensure Best Management Practices are used to maintain current drainage patterns, including: <ul style="list-style-type: none"> Implement infiltration techniques to the maximum extent possible. Minimize paved surfaces and design roads to promote infiltration. Limit changes in land contours. 	<ul style="list-style-type: none"> Effects to soil moisture and species composition of vegetation minimized. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Site inspection by Environmental Monitor following grading activities within 30 m of significant wetlands. Contingency Measures: <ul style="list-style-type: none"> If surface water drainage alterations are detected, undertake corrective measures to restore drainage patterns.

Table 5.2 Potential Effects on Significant Wetlands and Mitigation Measures

Significant Wetland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<p>Operation</p> <ul style="list-style-type: none"> Risk of soil or water contamination from oil, gas, etc. during maintenance activities where access roads, turbines or the transmission line are within 30 m of significant wetlands. 	<ul style="list-style-type: none"> No off-site contamination of soil or no contamination of groundwater or surface water. 	<ul style="list-style-type: none"> Develop and implement an emergency spills plan outlining steps to contain any spills during maintenance activities to avoid contamination of significant wetlands. 	<ul style="list-style-type: none"> Residual effects considered negligible. 	<ul style="list-style-type: none"> No monitoring required. Contingency Measures: <ul style="list-style-type: none"> Report the details of the spill to MOE, including a description of any assessment and remediation undertaken.
<p>Wetlands 30 m to 120 m from Project Infrastructure</p> <p>WET-008: 38 m (collection line) WET-009: 100 m (collection line) WET-038: 114 m (transmission line)</p>	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> Risk of soil or water contamination resulting from accidental spills of fuel, etc. 	<ul style="list-style-type: none"> Minimize soil or water contamination. 	<ul style="list-style-type: none"> Develop and implement emergency spills plan outlining steps to contain any chemicals or to avoid contamination of adjacent wetland features. Refer to General Mitigation Measures (Section 5.4). 	<ul style="list-style-type: none"> Soil and water contamination avoided or minimized through the application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Contractor to conduct routine inspections of construction equipment for leaks / spills. Develop an emergency spills plan. Contingency Measures: <ul style="list-style-type: none"> Immediately stop all work until the spill is cleaned up. Notify MOE's Spills Action Centre of any leaks or spills. If a spill enters a wetland, collect and analyze water samples for appropriate parameters. Monitor daily until cleanup is completed.
	<p>Operation</p> <ul style="list-style-type: none"> No effects on significant wetlands during operation. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> No effects on significant wetlands during operation. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.
<p>Wetland where a collection line or the transmission line will be installed via horizontal directional drilling</p> <p>WET-006: distance of 82 m; WET-010: distance of 127 m; WET-012: distance of 141 m; WET-014: distance in three locations of 49 m, 20 m and 122 m; WET-021: distance of 139 m; WET-025: distance of 222 m;</p>	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> Potential for unplanned intrusion into wetlands in event of equipment malfunction due to directional drilling. Risk of soil or water contamination from spills during directional drilling. Risk of sedimentation or erosion into significant wetlands when directionally drilling. 	<ul style="list-style-type: none"> Minimize potential for accidental intrusion into significant wetlands. Minimize soil or water contamination. Minimize erosion, sedimentation and turbidity during directional drilling. 	<ul style="list-style-type: none"> Refer to General Mitigation Measures (Section 5.4) for standard mitigation measures. Where feasible, wetland crossings will be within existing right-of-ways adjacent to wetland areas. Where wetlands cannot be avoided, crossings will be completed via horizontal directional drilling as per O. Reg. 359/09. Locate entrance and exit pits at least 30 m from wetland edge. Install sediment fencing as per Ontario Provincial Standard Specifications (OPSD 219.130). Ensure drill depth is at an appropriate depth below wetland to reduce the risk of a "frac-out". Restore drilling sites to pre-construction conditions once construction is complete. 	<ul style="list-style-type: none"> Risk of unplanned intrusion into wetland due to directional drilling, resulting in soil or water contamination and/or sedimentation and erosion, minimized through the application of mitigation measures. Moderate likelihood; if unplanned intrusion occurred negative effects may be measurable but would likely represent a small change relative to existing conditions. 	<ul style="list-style-type: none"> Monitor directional drilling for the duration of such activities by an Environmental Monitor to ensure that "frac-out" or accidental intrusion does not occur, and if it does, to ensure that there are no effects on surface or groundwater. Contingency Measures: <ul style="list-style-type: none"> In the event of a "frac-out", implement the "Frac-Out" Contingency Plan as described in Section 5.4.

Table 5.2 Potential Effects on Significant Wetlands and Mitigation Measures

Significant Wetland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
WET-032: distance in two locations of 50 m and 59 m.			<ul style="list-style-type: none"> • Develop “Frac-Out” Contingency Plan outlining steps to contain any chemicals and avoid contamination of wetland feature. 		
	Operation <ul style="list-style-type: none"> • No effects on significant wetlands during operation. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • No effects on significant wetlands during operation. 	<ul style="list-style-type: none"> ▪ No monitoring or contingency measures required.

5.6 Significant Woodlands

This section describes potential negative environmental effects of the proposed Project on significant woodlands, as defined in the Natural Heritage Assessment Guide, during the construction, operational and decommissioning phases. Details regarding how the Construction Plan and Environmental Effects Monitoring Plan address these potential negative effects, including mitigation measures, performance objectives, monitoring methods and contingency measures, are also described herein.

A total of 65 woodlands meeting the criteria for significant woodlands under the Natural Heritage Assessment Guide have been identified within the Goshen Wind Energy Centre Project Study Area (refer to Figure 3.4). Four significant woodlands will be affected by clearing of vegetation for the transmission line (WOD-120, WOD-134, WOD-180 and WOD-200). No other above-ground project infrastructure is proposed within significant woodlands. The significant woodland features where vegetation removal is required, and the area of the feature that will be removed, are listed below:

- WOD-120: up to 0.05 ha of FOD8-1 and 0.2 ha of FOD9a (8.9% of WOD-120);
- WOD-134: up to 0.4 ha of FOD5-6 (9.1% of WOD-134);
- WOD-180: up to 0.9 ha of FOD7-1, 0.05 ha of FOD6-5, and 0.01 ha of SWD 3-3 (20.0% of WOD-180); and,
- WOD-200: up to 0.1 ha of FOD7f and 0.9 ha FOD6-5 (43.5% of WOD-200).

A total of up to 2.6 hectares of significant woodland is proposed to be removed to facilitate installation of the transmission line.

Where construction activities are proposed in agricultural fields adjacent to significant woodlands a 30 m buffer from the woodland edge, measured from the dripline, will be applied, where possible, in which no physical disturbance will be permitted. This buffer will mitigate potential negative environmental effects associated with construction and operation.

Through correspondence with MNR, a protocol was developed and applied to assess the current land use and slope at all locations where construction of turbines or access roads is proposed within 30 m of a significant woodland to determine whether a larger setback is warranted. All agricultural lands (*i.e.* lands outside the natural area boundaries) within the buffer area are currently under intensive agricultural use. These areas are therefore already disturbed as a result of agricultural activities which include ploughing and other farming practices. An analysis of topographical mapping (1 m contour intervals) was also undertaken to determine whether the land surface slopes toward woodland features wherever construction activities are proposed within 30 m. There are three locations where construction activities are proposed within 30 m of a significant woodland and the ground slopes towards the feature. A collection line is located at the western end of WOD-129, 5 m from the feature at a slope of 5.25%. Here, the collection line is located in the right-of-way of Kirkton Road, and is therefore not considered to have any significant effect to WOD-129 during the construction, decommissioning and operational phases of the Project, provided standard mitigation measures are followed (as described in Table 5.3 below). Two turbine construction disturbance areas are located within 30 m of significant woodlands. The construction disturbance area for Turbine 11 is located 27 m from WOD-306 on a 4.6 % slope, and the construction disturbance area for Turbine 12 is located 26 m from WOD-026 on a 5 % slope. No significant effect to WOD-306 or WOD-026 is anticipated as the infrastructure is negligibly closer to the features than 30 m, provided standard mitigation measures are followed (as described in Table 5.3 below).

Installing collection and transmission lines above ground would result in habitat fragmentation, loss of habitat for woodland flora and fauna, and an increase in the potential for invasive plant establishment. To avoid these potential

effects, collection lines and transmission lines will be installed under significant woodlands via directional drilling techniques in eleven locations (Collection Line: WOD-001, WOD-018, WOD-032, WOD-034, WOD-054, WOD-101, WOD-133, WOD-191, and WOD-313, Transmission Line: WOD-104 and WOD-109). In order to avoid impacts to significant woodlands associated with directional drilling, entrance and exit pits will be located a minimum of 30 m away from significant woodlands and no physical disturbance within the 30 m buffer will be permitted. This buffer will mitigate potential negative environmental effects associated with use of equipment and machinery for the installation of collection and transmission lines. Additional mitigation measures specific to the underground installation of collection and transmission lines, i.e., “frac-out” response plan, are shown in described in Section 5.4 of this report and in Table 5.2 below. The woodland features where directional drilling is required, and the approximate distance of significant woodlands under which drilling will occur, are listed below:

- WOD-001: 80 m;
- WOD-018: 21 m;
- WOD-032: 42 m, 121 m (two locations);
- WOD-034: 20 m;
- WOD-054: 128 m;
- WOD-101: 48 m;
- WOD-133: 59 m;
- WOD-191: 140 m;
- WOD-313: 220 m;
- WOD-104: 13 m; and,
- WOD-109: 60 m.

5.6.1 Mitigation Measures

Mitigation measures to address potential negative environmental effects of Project construction, operation and decommissioning on significant woodlands are presented in Table 5.3. This table describes the potential negative environmental effects, performance objectives, mitigation measures, monitoring plans, and contingency measures to be used should monitoring show that further action is required, as they relate to significant woodlands located within 120 m of the proposed Project.

Table 5.3 Potential Effects on Significant Woodlands and Mitigation Measures

Significant Woodland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
Woodlands within 5 m of Project infrastructure WOD-001: >0.1 m (access road) WOD-018: >0.1 m (collection line) WOD-023: >0.1 m (collection line) WOD-032: >0.1 m (collection line) WOD-033: >0.1 m (collection line) WOD-034: >0.1 m (collection line) WOD-047: >0.1 m (access road) WOD-049: >0.1 m (collection line) WOD-053: >0.1 m (turbine construction footprint) WOD-054: >0.1 m (collection line) WOD-060: >0.1 m (access road) WOD-064: >0.1 m (access road) WOD-087: >0.1 m (collection line) WOD-093: >0.1 m (transmission line and substation) WOD-101: >0.1 m (collection line) WOD-103: >0.1 m (substation) WOD-104: >0.1 m (transmission line) WOD-109: >0.1 m (transmission line) WOD-118: 4 m (collection line) WOD-129: >0.1 m (collection line) WOD-131: >0.1 m (collection line) WOD-133: >0.1 m (collection line) WOD-154: >0.1 m (transmission line) WOD-191: >0.1 m (collection line) WOD-210: >0.1 m (transmission line) WOD-277: >0.1 m (collection line) WOD-231: 4 m (access road) WOD-251: >0.1 m (access road) WOD-278: >0.1 m (collection line) WOD-295: >0.1 m (collection line) WOD-313: >0.1 m (collection line)	Construction/ Decommissioning <ul style="list-style-type: none"> Accidental intrusion into significant woodlands resulting in damage to trees. 	<ul style="list-style-type: none"> Avoid accidental intrusion into significant woodlands. 	<ul style="list-style-type: none"> Maintain 5 m setback from significant woodlands, measured from the dripline of trees. Where construction occurs within 30 m, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation. 	<ul style="list-style-type: none"> Accidental intrusion will be avoided through clear delineation of boundaries and protective fencing. Negligible residual effects. 	<ul style="list-style-type: none"> Undertake weekly site inspections by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. Contingency Measures: <ul style="list-style-type: none"> Repair protective fencing if damaged. Any damaged trees will be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. In the event that other woodland vegetation is damaged, habitat restoration will occur utilizing native species suited to the habitat within the disturbed area.
	<ul style="list-style-type: none"> Changes in surface water drainage patterns resulting in effects to soil moisture and species composition of vegetation. 	<ul style="list-style-type: none"> Minimize effects to soil moisture and species composition of vegetation. 	<ul style="list-style-type: none"> Ensure Best Management Practices are used to maintain current drainage patterns, including: <ul style="list-style-type: none"> Implement infiltration techniques to the maximum extent possible. Minimize paved surfaces & design roads to promote infiltration. Limit changes in land contours. 	<ul style="list-style-type: none"> Effects to soil moisture and species composition of vegetation minimized. Low likelihood and limited magnitude of effects as a result. 	<ul style="list-style-type: none"> Site inspection by Environmental Monitor following grading activities within 30 m of significant woodlands. Contingency Measures: <ul style="list-style-type: none"> If surface water drainage alterations are detected, undertake corrective measures to restore drainage patterns.
	<ul style="list-style-type: none"> Increased erosion and sedimentation resulting from clearing and grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Minimize erosion and sedimentation from clearing, grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Install sediment and erosion control fencing along edge of construction area if within 30 m of a woodland, as per Ontario Provincial Standard Specifications (OPSD 219.130). Refer to General Mitigation Measures (Section 5.4) for mitigation measures including sediment and erosion controls to be applied. 	<ul style="list-style-type: none"> Sedimentation avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Monitor on-site conditions (<i>i.e.</i>, erosion and sediment control, flooding, etc.) by an Environmental Monitor where construction occurs within 30 m of a feature on the following basis: <ul style="list-style-type: none"> Weekly during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (<i>i.e.</i>, spring freshet); Daily during extended rain or snowmelt periods; Monthly during inactive construction periods, where the site is left alone for 30 days or longer. Contingency Measures: <ul style="list-style-type: none"> Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place (e.g. install the extra erosion and sediment control materials kept on site, such as heavy duty silt fencing, straw bales, etc.).
Operation <ul style="list-style-type: none"> No effects on significant woodlands during operation. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> No effects on significant woodlands during operation. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.

Table 5.3 Potential Effects on Significant Woodlands and Mitigation Measures

Significant Woodland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
Woodlands 5 m to 30 m from Project Infrastructure WOD-012: 7 m (turbine construction footprint) WOD-026: 21 m (turbine blade tip) WOD-028: 8 m (collection line) WOD-113: 24 m (transmission line) WOD-114: 11 m (collection line) WOD-117: 13 m (turbine construction footprint) WOD-130: 11 m (transmission line) WOD-146: 11 m (turbine construction footprint) WOD-149: 9 m (access road) WOD-286: 16 m (collection line) WOD-289: 21 m (access road) WOD-300: 10 m (turbine construction footprint) WOD-301: 8 m (collection line) WOD-303: 5 m (collection line) WOD-306: 27 m (turbine construction footprint) WOD-328: 10 m (access road) WOD-331: 23 m (access road)	Construction/Decommissioning <ul style="list-style-type: none"> Accidental intrusion into significant woodlands resulting in damage to trees. 	<ul style="list-style-type: none"> Avoid accidental intrusion into significant woodlands. 	<ul style="list-style-type: none"> Maintain 5 m setback from significant woodlands, measured from the dripline of trees. Where construction occurs within 30 m, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation. Refer to General Mitigation Measures (Section 5.4) for standard mitigation measures. 	<ul style="list-style-type: none"> Accidental intrusion will be avoided through clear delineation of boundaries and protective fencing. Negligible residual effects. 	<ul style="list-style-type: none"> Undertake weekly site inspections by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. Contingency Measures: <ul style="list-style-type: none"> Repair protective fencing if damaged. Any damaged trees will be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. In the event that other woodland vegetation is damaged, habitat restoration will occur utilizing native species suited to the habitat within the disturbed area.
	<ul style="list-style-type: none"> Changes in surface water drainage patterns resulting in effects to soil moisture and species composition of vegetation. 	<ul style="list-style-type: none"> Minimize effects to soil moisture and species composition of vegetation. 	<ul style="list-style-type: none"> Ensure Best Management Practices are used to maintain current drainage patterns, including: <ul style="list-style-type: none"> Implement infiltration techniques to the maximum extent possible. Minimize paved surfaces & design roads to promote infiltration. Limit changes in land contours. 	<ul style="list-style-type: none"> Effects to soil moisture and species composition of vegetation minimized. Low likelihood and limited magnitude of effects as a result. 	<ul style="list-style-type: none"> Site inspection by Environmental Monitor following grading activities within 30 m of significant woodlands. Contingency Measures: <ul style="list-style-type: none"> If surface water drainage alterations are detected, undertake corrective measures to restore drainage patterns.
	<ul style="list-style-type: none"> Increased erosion and sedimentation resulting from clearing and grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Minimize erosion and sedimentation from clearing, grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Install sediment and erosion control fencing along edge of construction area if within 30 m of a woodland, as per Ontario Provincial Standard Specifications (OPSD 219.130). Refer to General Mitigation Measures (Section 5.4) for mitigation measures including sediment and erosion controls to be applied. 	<ul style="list-style-type: none"> Sedimentation avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Monitor on-site conditions (<i>i.e.</i>, erosion and sediment control, flooding, etc.) by an Environmental Monitor where construction occurs within 30 m of a feature on the following basis: <ul style="list-style-type: none"> Weekly during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (<i>i.e.</i>, spring freshet); Daily during extended rain or snowmelt periods; Monthly during inactive construction periods, where the site is left alone for 30 days or longer. Contingency Measures: <ul style="list-style-type: none"> Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place (e.g. install the extra erosion and sediment control materials kept on site, such as heavy duty silt fencing, straw bales, etc.).
	Operation <ul style="list-style-type: none"> No effects on significant woodlands during operation. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> No effects on significant woodlands during operation. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.

Table 5.3 Potential Effects on Significant Woodlands and Mitigation Measures

Significant Woodland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
Woodlands 30 to 120 m from Project infrastructure WOD-063: 68 m (turbine construction footprint) WOD-068: 67 m (access road) WOD-070: 52 m (access road) WOD-076: 116 m (turbine construction footprint) WOD-106: 37 m (turbine construction footprint) WOD-112: 77 m (transmission line) WOD-135: 94 m (transmission line) WOD-136: 115 m (transmission line) WOD-137: 49 m (turbine construction footprint) WOD-145: 40 m (transmission line) WOD-158: 36 m (access road) WOD-176: 47 m (collection line) WOD-309: 49 m (turbine construction footprint)	Construction/Decommissioning <ul style="list-style-type: none"> No effects on significant woodlands during construction. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> No effects on significant woodlands during construction. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.
	Operation <ul style="list-style-type: none"> No effects on significant woodlands during operation. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> No effects on significant woodlands during operation. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.
Woodlands where vegetation removal is proposed WOD-120: up to 0.05 ha of FOD8-1 and 0.2 ha of FOD9a (8.9% of woodland area); WOD-134: up to 0.4 ha of FOD5-6 (9.1% of woodland area); WOD-180: up to 0.9 ha of FOD7-1, 0.05 ha of FOD6-5, and 0.01 ha of SWD 3-3 (20.0% of woodland area); WOD-200: up to 0.1 ha of FOD7f and 0.9 ha FOD6-5 (43.5% of woodland area).	Construction/Decommissioning <ul style="list-style-type: none"> Clearing of vegetation for transmission line in significant woodlands resulting in loss of forest cover. 	<ul style="list-style-type: none"> Minimize loss of forest cover over time. 	<ul style="list-style-type: none"> Refer to General Mitigation Measures (Section 5.4) for standard mitigation measures. Establish an area of forest equal in area to the cleared area (up to 2.6 ha) through tree planting and management (e.g., in partnership with a local Conservation Authority). Details of the afforestation plan will be described in a Compensation Plan to be developed in consultation with MNR. Perform vegetation clearing outside of the breeding bird season (May 1 to July 31). 	<ul style="list-style-type: none"> Clearing of vegetation will occur for the transmission line. Loss of forest cover minimized through afforestation; however there will be a time delay for the planted area to reach the same function as the cleared forest. 	<ul style="list-style-type: none"> Daily monitoring of areas where active vegetation removal is occurring by Environmental Monitor. Monitor establishment of planted area and replant/fill plant if required (may be undertaken by partner organization). Contingency Measures: <ul style="list-style-type: none"> Any damaged trees will be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester.

Table 5.3 Potential Effects on Significant Woodlands and Mitigation Measures

Significant Woodland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
			<p>Undertake active nest surveys prior to construction if clearing of vegetation must take place during this period. Refer to section 5.8 for additional timing constraints related to wildlife.</p> <ul style="list-style-type: none"> Clearly stake area to be cleared. Fell trees with a chainsaw toward the construction area to reduce damage to adjacent vegetation being retained. Limit size of machines entering significant woodlands to minimize soil compaction. Carry out removal of tree limbs on adjacent trees being retained under supervision of an Arborist or Forester. Cut damaged tree roots clean as soon as possible and cover exposed roots in approved topsoil under supervision of an Arborist or Forester. 		
	<p>Operation</p> <ul style="list-style-type: none"> Absence of forest cover (up to 2.6 ha) removed during construction of the transmission line in significant woodlands. 	<ul style="list-style-type: none"> No loss of forest cover over time. 	<ul style="list-style-type: none"> Establish an area of forest equal in area to the cleared area (up to 2.6 ha) through tree planting and management (e.g., in partnership with a local Conservation Authority). Details of the afforestation plan will be described in a Compensation Plan to be developed in consultation with MNR. 	<ul style="list-style-type: none"> Clearing of vegetation will occur for the transmission line. Loss of forest cover minimized through afforestation; however there will be a time delay for the planted area to reach the same function as the cleared forest. 	<ul style="list-style-type: none"> Conduct post-planting inventory of planted area to determine success of establishment (may be undertaken by partner organization). Contingency Measures: <ul style="list-style-type: none"> If plantation is not establishing for any number of reasons, conduct silvicultural intervention including, but not limited to: fill planting, cleaning, re-planting or thinning (may be undertaken by partner organization).
	<ul style="list-style-type: none"> Disturbance to vegetation from herbicide spraying for maintenance of the transmission line. 	<ul style="list-style-type: none"> Minimize disturbance to vegetation. 	<ul style="list-style-type: none"> Minimize aerial extent of herbicide spraying along transmission line. Only apply herbicides when wind speeds are low and no significant precipitation is expected (does not apply to agricultural practices). 	<ul style="list-style-type: none"> Operational effects considered negligible. 	<ul style="list-style-type: none"> As appropriate, and following the schedule for the application of herbicides. A certified Arborist should be present on site during the application of herbicides along the transmission line.

Table 5.3 Potential Effects on Significant Woodlands and Mitigation Measures

Significant Woodland	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
<p>Woodlands where collection lines or the transmission line will be installed via directional drilling beneath woodlands</p> <p>WOD-001: distance of 80 m; WOD-018: distance of 21 m; WOD-032: distance of 42 m and 121 m (two locations); WOD-034: distance of 20 m; WOD-054: distance of 128 m; WOD-101: distance of 48 m; WOD-133: distance of 59 m; WOD-191: distance of 140 m; WOD-313: distance of 220 m; WOD-104: distance of 13 m; WOD-109: distance of 60 m.</p>	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Potential for unplanned intrusion into woodlands in event of equipment malfunction due to directional drilling under significant woodlands. • Risk of soil or water contamination resulting from accidental spills during directional drilling. • Risk of sedimentation or erosion into significant woodlands when directionally drilling. 	<ul style="list-style-type: none"> • Minimize potential for accidental intrusion into significant woodlands. • Minimize soil or water contamination. • Minimize erosion, sedimentation and turbidity during directional drilling. 	<ul style="list-style-type: none"> • Refer to General Mitigation Measures (Section 5.4) for standard mitigation measures. • Locate entrance and exit pits at least 30 m from woodland edge. • Install sediment fencing as per Ontario Provincial Standard Specifications (OPSD 219.130). • Ensure drill depth is at an appropriate depth below woodland to reduce the risk of a “frac-out”. • Restore drilling sites to pre-construction conditions once construction is complete. • Develop “Frac-Out” Contingency Plan outlining steps to contain any chemicals and avoid contamination of woodland features. 	<ul style="list-style-type: none"> • Soil and water contamination avoided or minimized through application of mitigation measures. • Moderate likelihood; if accidental damage occurred negative effects may be measurable but would likely represent a small change relative to existing conditions. 	<ul style="list-style-type: none"> • Monitor directional drilling for the duration of such activities by an Environmental Monitor to ensure that “frac-out” or accidental intrusion does not occur, and if it does, to ensure that there are no effects on surface or groundwater. • Contingency Measures: <ul style="list-style-type: none"> ▪ In the event of a “frac-out”, implement the “Frac-Out” Contingency Plan as described in Section 5.4.
	<p>Operation</p> <ul style="list-style-type: none"> • No effects on significant woodlands during operation. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • No effects on significant woodlands during operation. 	<ul style="list-style-type: none"> • None required.

5.7 Significant Valleylands

The transmission line is the only Project component proposed within the single significant valleyland boundary (Figure 3.5). The location of the transmission line crossing of the significant valleyland feature corresponds with the crossing of wetland feature WET-12; therefore, this crossing will be undertaken via directional drilling where natural vegetation occurs. The portions of this crossing located more than 30 m from the wetland boundaries will consist of an above-ground transmission line. The following project components are within 120 m of the significant valleyland: Turbine 67, underground collection lines and access roads.

According to a recent amendment to O.Reg. 359/09, significant valleylands are no longer included as natural features requiring an Environmental Impact Study; therefore, mitigation measures and monitoring commitments related to the valleyland feature are not presented here. Refer to Sections 5.5, 5.6 and 5.8 for mitigation measures to be applied where this feature is overlapped by significant wetlands, woodlands or wildlife habitats.

5.8 Significant Wildlife Habitat

This section describes potential negative environmental effects of the proposed Project on Significant Wildlife Habitat, as defined in the Natural Heritage Assessment Guide, during the construction, operational and decommissioning phases. Details regarding how the Construction Plan and Environmental Effects Monitoring Plan address these potential negative effects, including mitigation measures, performance objectives, monitoring methods and contingency measures, are also described herein.

5.8.1 Potential Direct Effects of Wind Turbine Operation on Birds and Bats

The Natural Heritage Assessment process focuses on the consideration and protection of Significant Wildlife Habitats during the Project planning and layout design process. Alterations to the proposed Goshen Wind Energy Centre were made during the planning and layout design stages of this Project to avoid Significant Wildlife Habitat and other significant natural features to the extent possible, while working within other constraints. This habitat-based approach is a key factor in preventing negative effects on birds and bats (MNR, 2011g; MNR, 2011h).

In North America, wind turbines present less of a danger to birds than other anthropogenic sources of mortality such as buildings or roads (Erickson, *et al.*, 2001). Birds and bats may be injured or killed through collisions with moving turbine blades, and air pressure changes near moving turbine blades may also result in bat mortality. On the basis of bird mortality monitoring results from Ontario wind power projects, the MNR has concluded that mortality resulting from wind turbines is not considered to be a concern for most of Ontario's bird populations (MNR, 2011h). Bat mortality rates vary widely across wind power projects (MNR, 2011g).

Potential effects of the proposed Project on birds and bats are also addressed through the Environmental Effects Monitoring Plan (EEMP), as described in the Design and Operation Report (AECOM, 2012c). The EEMP outlines rigorous monitoring requirements to address potential impacts on bird and bat species during the first three years of operation. More specifically, the EEMP summarizes potential effects; identifies performance objectives with respect to the potential negative effects; describes mitigation measures to achieve the performance objectives; identifies contingency mitigation measures to be implemented based on the monitoring results; and commits to future monitoring to ensure the mitigation measures meet the performance objectives (refer to Table 5.4 below). The results of all post-construction monitoring conducted according to the EEMP will be submitted to the MNR for review on an annual basis.

Table 5.4 Environmental Effects Monitoring Plan for Direct Effects of Turbine Operation on Birds and Bats

Potential Effect	Performance Objective	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
<p>Risk of bird mortality caused by turbines (Project-wide).</p> <p>Risk of bat mortality caused by turbines (Project-wide).</p>	<ul style="list-style-type: none"> Minimize disturbance and/or mortality to wildlife. 	<ul style="list-style-type: none"> Utilize a lighting scheme that will minimize risk to bird or bat collisions, while fulfilling Transport Canada requirements. Implement contingency mitigation measures if mortality thresholds are exceeded based on the results of post-construction monitoring. Operational mitigation techniques for birds, which would be applied at times of the year when mortality risks to the affected bird species are particularly high (e.g., migration) may include: <ul style="list-style-type: none"> Periodic shut-down of select turbines. Blade feathering Mitigation techniques for bats may include: <ul style="list-style-type: none"> Changing the wind turbine cut-in speed to 5.5 m/s Feathering of blades when wind speeds are below 5.5 m/s Co-ordinating turbine shut-down for maintenance with periods of high bat activity (specifically in June during the breeding season when bat maternity colony habitats are occupied) and/or mortality. 	<ul style="list-style-type: none"> Risk of bird and bat collisions with turbine minimized through mitigation. Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> Develop and implement a monitoring program for bird and bat mortality consistent with <i>Birds and Bird Habitats: Guidelines for Wind Power Projects</i> (MNR, 2011h) and <i>Bats and Bat Habitats: Guidelines for Wind Power Projects</i> (MNR, 2011g) including: <ul style="list-style-type: none"> Mortality surveys; Carcass removal trials; and Searcher efficiency trials. Conduct monitoring during the core season for bird activity and bat activity (May 1-October 31) for the first three years of operation. Mortality surveys will be conducted at each monitored turbine twice per week (at least 30% of turbines) and raptor mortality surveys will be continued once per week in November. Monitor all turbines within the Project Location once during the survey period for evidence of raptor mortalities. Conduct subsequent monitoring for two years at individual turbines (and unmonitored turbines in close proximity) where significant bird or raptor annual mortality is identified. Conduct effectiveness monitoring at individual turbines for three years where mitigation has been implemented. Report the findings of the bird and bat mortality monitoring programs to MNR on an annual basis for the first 3 years of operation. Contingency Measures: <ul style="list-style-type: none"> Institute changes to turbine operation if mortality thresholds are exceeded (see mitigation strategy in this table).

For the Goshen Wind Energy Centre, a subsample of at least 30% of turbines will be selected for post-construction bird and bat mortality monitoring in consultation with MNR, to cover representative areas throughout the Project Location.

5.8.2 Potential Effects on Significant Wildlife Habitat

The following Significant Wildlife Habitats were either evaluated and confirmed to be significant or treated as significant, and occur within 120 m of Project infrastructure:

- Waterfowl (Tundra Swan) stopover and staging areas (WSST-15 and WSST-36);
- Bat maternity colonies (BMC-189, BMC-229, BMC-326, BMC-757, BMC-235, BMC-242, BMC-249, BMC-267, BMC-282, BMC-285, BMC-342, BMC-352, BMC-358, BMC-372, BMC-648 and BMC-720);
- Turtle wintering areas (TOW-01 and TOW-03);
- Reptile hibernacula (RH-01, RH-02, RH-03, RH-04, RH-05, RH-06, RH-07 and RH-08);
- Colonially-nesting bird breeding habitat (tree/shrub) (CNB-01);
- Deer winter congregation area (DWC-01);
- Amphibian woodland breeding habitat (AWO-02, AWO-14, AWO-25, AWO-27, AWO-30, AWO-33, AWO-34 and AWO-35);
- Habitat for plant species of conservation concern (multiple) (SCP-12, SCP-13, SCP-14, SCP-15, SCP-16 and SCP-17);
- Habitat for bird species of conservation concern (Red-headed Woodpecker) (SCB-03); and
- Deer movement corridor (WOD-331).

Vegetation removal is planned for transmission line construction in three natural areas containing the following Significant Wildlife Habitat features:

- Natural area 648 (up to 0.25 ha): bat maternity colony (BMC-648) and amphibian woodland breeding habitat (AWO-35);
- Natural area 721 (up to 1.0 ha): amphibian woodland breeding habitat (AWO-34); and,
- Natural area 720 (up to 1.0 ha): bat maternity colony (BMC-720), amphibian woodland breeding habitat (AWO-33), and habitat for bird species of conservation concern (Red-headed Woodpecker) (SCB-03).

Potential effects of vegetation removal in these Significant Wildlife Habitats include the loss of forest cover, creation of edge effects exposing habitat and fragmentation. This loss of forest area, creation of edge effects and fragmentation may have a negative effect on the habitat suitability of the woodland for wildlife species. Vegetation removal in natural areas identified as Significant Wildlife Habitat may displace bats, amphibians or bird species of conservation, or disturb the natural areas such that they become less suitable or unsuitable as habitat for these species. No other above-ground project infrastructure is proposed within Significant Wildlife Habitat.

Negative effects of wind turbine operation on Significant Wildlife Habitat include the potential for disturbance or disruption to wildlife resulting from noise or vibration emitted from turbines. There is limited literature on the effects of wind turbine disturbance, based on sound and/or vibration, on wildlife. Potential effects include the masking of auditory signals such as amphibian calls and alarm calls. Those studies that have been conducted appear to show little or no behavioural impact of wind turbines on various bird species, although this apparent lack of evidence may also reflect deficiencies in the type or intensity of monitoring (Kingsley and Whittam, 2007). Other studies suggest the behaviour of some wildlife species can be influenced by active turbine operation, for example squirrels may exhibit elevated levels of vigilance and caution (Kikuchi, 2008). It is assumed, but not certain, that behavioural change is caused by noise rather than other factors (Rabin *et al.*, 2006). Other studies suggest that because noise from sources other than turbines, such as traffic, is documented to have negative effects on certain wildlife species at varying distances from the noise source, turbines are likely to have similar effects (U.S. Fish & Wildlife Service, date unavailable). Population-level effects of behavioural change due to noise, as well as definitive setback distances, largely remain to be explored.

The MNR has assessed various types of significant wildlife habitat and identified those types that may be affected by turbine operation, including noise and vibration (Natural Heritage Assessment Guide, Appendix D). Where these habitats occur within 120 m of a proposed turbine location, post-construction monitoring for disturbance effects will occur.

Risks to amphibian woodland breeding habitats, reptile hibernacula and turtle wintering areas are primarily the result of sensitivity of amphibians, snakes and turtles to road mortality associated with migrating between breeding pond/hibernacula/over-wintering sites and their main home range. Amphibians move mostly at night and in particular rainy nights, and that is when the greatest mortality would occur. Once construction is complete, traffic is expected to be very light and rarely at night; therefore road mortality is not expected to be significant enough at any location to warrant the use of culverts and drift fences to direct amphibian movements under roads.

Studies into the impacts of wind turbines on Tundra Swan migration are still in the preliminary stages in North America as large scale wind energy development has only recently started to occur. However, European studies on the impacts of wind farms on swan populations are more readily available due to the abundance of European wind energy developments. Despite indicating that geese and swan populations are potentially more vulnerable to risk of collision with wind turbines due their large size and low manoeuvrability (Moorehead and Epstein, 1985) these studies have found that relatively few collisions of geese or swans with wind turbines have been recorded (Hötter *et al.*, 2006). These studies do however note that swans can be particularly sensitive to disturbance and often maintain

an average minimum distance of 125 m to 150 m from wind turbines within feeding or staging habitat (Hötker *et al.* 2006). Another study recommends a precautionary minimum setback distance for wind turbines from important feeding or roosting areas for waterfowl of 400 m (Bright *et al.*, 2009). Information provided in the MNR Significant Wildlife Habitat Technical Guide (2000) recommends a buffer for Tundra Swan Stopover and Staging habitat ranging from 100 m to 300 m. A conservative approach was taken for the proposed Project, where a 300 m buffer was applied to Tundra Swan stopover and staging habitats to protect the form and function of these features. Mitigation measures to address potential effects of Project infrastructure proposed within 120 m of this 300 m buffer are described below.

Negative effects to deer are not anticipated as a result of the Project. Deer are generally quite adaptable to human disturbances and will move considerable distances between patches of suitable habitat, particularly at night; therefore operational effects on deer movement corridors are not expected. The only anticipated negative effect to deer is possible temporary avoidance from the vicinity of active construction. There is some evidence that similar species including North American Elk, Norwegian Red Deer and Reindeer may temporarily avoid wind farms during construction (just as they would avoid any other construction activities), but come back to graze in wind farms during operation (Helldin and Alvares, 2011; Helldin *et al.* 2012). A study of the effect of wind turbine operation on deer and other game animals found no evidence of different habitat use or distribution in areas with operating wind farms, and that the number of scats and tracks was similar for all distances (10 m to 1,000 m) from turbines (Menzel and Pohlmeier, 1999). Similarly, studies of the effect of wind turbine operation on domestic reindeer have found no evidence of avoidance or changes in behaviour indicative of fear or stress from noise or visual effects (Flydal *et al.* 2004). There is some evidence that deer will avoid high traffic roads (Helldin *et al.* 2012), however access roads associated with the Project are expected to be used very infrequently during operation therefore negative effects on deer are not expected.

In addition, the following candidate Significant Wildlife Habitats were identified within the 120 m Area of Investigation however not within 120 m of qualifying project infrastructure, and were therefore considered Generalized Candidate Significant Wildlife Habitat:

- Bat maternity colonies (numerous);
- Turtle wintering areas (natural areas 255, 266, 609, 720 and 754);
- Reptile hibernacula (natural areas 236, 661 and 695);
- Mature forest stands (numerous);
- Other rare vegetation communities (natural area 309);
- Waterfowl nesting areas (natural area 209);
- Woodland raptor nesting habitat (Woodland units WOD-117, WOD-131 and WOD-331);
- Turtle nesting areas (natural area 209);
- Seeps and springs (natural areas 232, 249, 266, 267, 273, 280, 309, 369, 609 and 723);
- Amphibian woodland breeding habitat (natural areas 209, 210, 232, 236, 255, 266, 269, 280, 309, 342 and 375);
- Amphibian wetland breeding habitat (natural areas 236, 609 and 754);
- Woodland area-sensitive bird breeding habitat (WOD-131 and WOD-331);
- Terrestrial crayfish habitat (natural area 225);
- Habitats of plant species of conservation concern (numerous);
- Habitat of bird species of conservation concern (numerous); and,
- Habitat of insect species of conservation concern (numerous).

No above-ground project infrastructure is proposed within Generalized Candidate Significant Wildlife Habitat and no vegetation clearing will be required in Generalized Candidate Significant Wildlife Habitat to accommodate the

proposed Project. As a result, there will be no direct loss or fragmentation of these habitats. Potential effects of the proposed Project on Generalized Candidate Significant Wildlife Habitat will be avoided or minimized during the construction, operation and decommissioning phases, provided standard mitigation measures are followed (as described below).

5.8.3 Mitigation Measures

Mitigation measures to address potential effects on Generalized Candidate Significant Wildlife Habitat are described in Table 5.5. These mitigation measures will also be applied to all Significant Wildlife Habitat features as described above. Additional mitigation measures to address potential environmental effects of Project construction, operation and decommissioning on specific Significant Wildlife Habitat features are presented in Table 5.6. These tables describe the potential negative environmental effects, performance objectives, mitigation measures, monitoring plans, and contingency measures to be used should monitoring show that further action is required, as they relate to Significant Wildlife Habitat located within 120 m of the proposed Project.

The significance of some Candidate Significant Wildlife Habitats (e.g., amphibian woodland breeding habitat, reptile hibernacula, bat maternity colonies, turtle wintering areas) has yet to be determined, as additional field studies are required to evaluate the significance of these features. For the purposes of this submission, these Candidate Significant Wildlife Habitats have been treated as significant, and mitigation measures and monitoring related to these features is described below. However, the mitigation or monitoring related to these significance designations will only be implemented if the features in question are deemed to be significant under the criteria described in the Evaluation of Significance (Section 4). In instances where these features meet other criteria for significance (i.e., as significant woodlands, wetlands), refer also to other sections of this report for relevant discussion of potential effects and mitigation measures.

Table 5.5 Potential Effects on Generalized Candidate Significant Wildlife Habitat and Mitigation Measures

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
<p>Construction/ Decommissioning</p> <ul style="list-style-type: none"> Increased erosion and sedimentation resulting from clearing and grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Minimize erosion and sedimentation from clearing, grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Develop and implement an erosion and sediment control plan before commencement of construction as per Ontario Provincial Standard Specifications (OPSD 219.130). Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales). Check that erosion control tools are in good repair and properly functioning prior to conducting daily work and re-install or repair as required prior to commencing daily construction activities. Keep sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated). To avoid sedimentation in wetlands and watercourses, schedule grading within 30 m of a watercourse or wetland to avoid times of high runoff volumes, wherever possible. Temporarily suspend work if high runoff volume is noted or excessive flows of sediment discharges occur until contingency measures are in place. Re-vegetate temporary roads to pre-construction conditions as soon as possible after construction activities are complete using species native to Ontario in naturally vegetated areas. 	<ul style="list-style-type: none"> Increased erosion and sedimentation avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Monitor on-site conditions (i.e., erosion and sediment control, spills, flooding, etc.) where construction occurs within 30 m of a feature on the following basis: <ul style="list-style-type: none"> Weekly during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (i.e., spring freshet); Daily during extended rain or snowmelt periods; Monthly during inactive construction periods, where the site is left alone for 30 days or longer. Contingency Measures: <ul style="list-style-type: none"> Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place (e.g. install the extra erosion and sediment control materials kept on site, such as heavy duty silt fencing, straw bales, etc).
<ul style="list-style-type: none"> Removal/disturbance of topsoil and increased soil compaction from manoeuvring of heavy machinery, excavation and backfilling. 	<ul style="list-style-type: none"> Minimize removal/disturbance of topsoil and increased soil compaction. 	<ul style="list-style-type: none"> Where feasible, lighter vehicles and lighter machinery should be used in and around natural areas. Any vehicles used within natural areas should use wide-based tires. Tracked vehicles should be avoided. 	<ul style="list-style-type: none"> Increased erosion and sedimentation avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> See erosion and sedimentation above.

Table 5.5 Potential Effects on Generalized Candidate Significant Wildlife Habitat and Mitigation Measures

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
<ul style="list-style-type: none"> Increased erosion and sedimentation resulting from directional drilling. 	<ul style="list-style-type: none"> Minimize erosion and sedimentation. 	<ul style="list-style-type: none"> Conduct all drilling by licensed drillers in accordance with Regulation 903 under Ontario Water Resources Act, R.S.O. 1990. Set back drill entry and exit pits at least 30 m from natural features (<i>i.e.</i>, woodlands, wetlands) or water bodies. Monitor natural features for signs of surface disturbance (e.g., escape of drilling mud, evidence of tunnel collapse). 	<ul style="list-style-type: none"> Increased erosion and sedimentation avoided or minimized through application of mitigation measures. Moderate likelihood; if accidental damage occurred negative effects may be measurable but would likely represent a small change relative to existing conditions. 	<ul style="list-style-type: none"> See erosion and sedimentation above.
<ul style="list-style-type: none"> Disturbance and/or mortality to terrestrial wildlife, including barriers to wildlife movement. 	<ul style="list-style-type: none"> Minimize disturbance and/or mortality to terrestrial wildlife. 	<ul style="list-style-type: none"> Time vegetation removal to avoid periods of habitat use to the extent possible, particularly to avoid sensitive life stages (e.g., breeding season for migratory birds, May 1 to July 30). Undertake active nest surveys prior to construction if clearing of vegetation must take place during this period. Refer to Table 5.6 for additional timing windows related to specific types of Significant Wildlife Habitat. Avoid intersecting likely wildlife migration routes wherever possible. Construction and decommissioning activities within 30 m of woodlands or wetlands should occur during daylight hours (7:00 am to 7:00 pm) during the period of May 1 to July 31, wherever possible. Clearly post construction speed limits (30km/h). Install and maintain wildlife crossing and speed limit signs on access roads. 	<ul style="list-style-type: none"> Disturbance and/or mortality to terrestrial wildlife, including barriers to wildlife movement avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Undertake weekly site inspections to ensure that only specified trees are removed, protective fencing is intact and that there is no damage caused to the remaining trees during construction. Contingency Measures: <ul style="list-style-type: none"> In the event that trees are damaged during construction, damaged trees should be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. Consultation with MNR to determine additional contingency measures if necessary.
<ul style="list-style-type: none"> Damage to vegetation while operating equipment. 	<ul style="list-style-type: none"> Minimize disturbance to/loss of wildlife habitat and vegetation. 	<ul style="list-style-type: none"> Keep vegetation removal to a minimum and limited to non-significant habitats (e.g., hedgerows), where possible. For roadside collection line routes, vegetation removal (if any) will be kept to a minimum and will be limited to the road right-of-way. Where construction is to occur within 30 m of natural features, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation or intrusion into the natural feature. Where excavation for construction of access roads or collection lines is conducted adjacent to the dripline of woodlands (or within the dripline for collection line installation within road right-of-ways), implement proper root pruning measures to protect tree roots. 	<ul style="list-style-type: none"> Disturbance to or loss of wildlife habitat and damage to vegetation while operating equipment avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Undertake weekly site inspections to ensure that only specified trees are removed, protective fencing is intact and that there is no damage caused to the remaining trees during construction. Contingency Measures: <ul style="list-style-type: none"> Repair protective fencing if damaged. In the event that trees are damaged during construction, damaged trees should be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. If accidental damage to habitat occurs, habitat restoration will occur using suitable native species. Consultation with MNR to determine additional contingency measures if necessary.

Table 5.5 Potential Effects on Generalized Candidate Significant Wildlife Habitat and Mitigation Measures

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
<ul style="list-style-type: none"> Disturbance to or loss of wildlife habitat, including active bird nests. 	<ul style="list-style-type: none"> Minimize vegetation removal and destruction of bird nests. 	<ul style="list-style-type: none"> Schedule vegetation removal outside of breeding season (May 1 to July 30) where possible. Undertake active nest surveys prior to construction if clearing of vegetation must take place during this period. Refer to Table 5.6 for additional timing windows related to specific types of Significant Wildlife Habitat. Only apply herbicides (if required) when wind speeds are low and no significant precipitation is expected (does not apply to agricultural practices). Only use herbicides (if required) approved for use adjacent to water bodies, riparian buffers, or woodland edges (does not apply to agricultural practices). 	<ul style="list-style-type: none"> Vegetation removal minimized and destruction of active bird nests avoided through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Undertake weekly site inspections to ensure that only specified trees are removed, protective fencing is intact and that there is no damage caused to the remaining trees during construction. Contingency Measures: <ul style="list-style-type: none"> In the event that trees are damaged during construction, damaged trees should be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. If accidental damage to habitat occurs, habitat restoration will occur using suitable native species. Consultation with MNR to determine additional contingency measures if necessary.
<ul style="list-style-type: none"> Soil / water contamination by oils, gasoline, grease and other materials from construction equipment, materials storage and handling. 	<ul style="list-style-type: none"> Minimize soil/water contamination. 	<ul style="list-style-type: none"> Ensure machinery is maintained free of fluid leaks. Locate site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features or water bodies. Use spill collection pads for vehicle refuelling and maintenance. Store any stockpiled materials at least 30 m away from a wetland, woodland or water body to prevent deleterious substances from inadvertently discharging to the environment. Develop a spill response plan and train staff on associated procedures. Maintain emergency spill kits on site. Control soil / water contamination through best management practices. Dispose of any waste material from construction activities by authorized and approved off-site vendors. 	<ul style="list-style-type: none"> Soil and water contamination avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Contractor to conduct routine inspections of construction equipment for leaks / spills Develop an emergency spills plan. Contingency Measures: <ul style="list-style-type: none"> In the event of a spill, immediately stop all work until the spill is cleaned up; Notify MOE's Spills Action Centre of any leaks or spills; Assess and remediate affected soils and water by using spill kit kept on site; For spills near wetlands, analyze water samples for general chemistry (e.g., temperature, pH, dissolved oxygen, and conductivity), suspended solids, turbidity, nutrients and total metals (e.g., copper, iron, zinc and aluminum). Monitor daily to ensure proper cleanup is completed.

Table 5.5 Potential Effects on Generalized Candidate Significant Wildlife Habitat and Mitigation Measures

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
<ul style="list-style-type: none"> • Soil / water contamination by oils, gasoline, grease and other materials from spills during directional drilling. 	<ul style="list-style-type: none"> • Minimize soil/water contamination. 	<ul style="list-style-type: none"> • Conduct all drilling by licensed drillers in accordance with Regulation 903 under Ontario Water Resources Act, R.S.O. 1990. • Develop “Frac-Out” Contingency Plan outlining steps to contain any chemicals or to avoid contamination of adjacent features. • Collect drill cuttings as they are generated and place in a soil bin or bag for off-site disposal. • Ensure drill depth is at an appropriate depth below feature to reduce the risk of a “frac-out”. Drilling depth will be determined based on site-specific geotechnical conditions and will take into account soil type, soil variances and porosity, as derived from exploratory borehole information. • Install protective fencing around vegetation to prevent accidental damage. 	<ul style="list-style-type: none"> • Risk of soil / water contamination avoided or minimized through application of mitigation measures. • Moderate likelihood; if accidental damage occurred negative effects may be measurable but would likely represent a small change relative to existing conditions. 	<ul style="list-style-type: none"> • Monitor directional drilling for the duration of such activities to ensure that “frac-out” or accidental intrusion does not occur, and if it does, to ensure that there are no effects on surface or groundwater. • Contingency Measures: <ul style="list-style-type: none"> ▪ In the event of a “frac-out”, implement the “Frac-Out” Contingency Plan as described in Section 5.4.
<ul style="list-style-type: none"> • Changes in surface water drainage patterns. • Obstruction of lateral flows in surface water to wetlands. 	<ul style="list-style-type: none"> • Minimize changes in surface water drainage patterns and obstruction of lateral flows in surface water to wetlands. 	<ul style="list-style-type: none"> • Minimize changes in land contours and natural drainage; maintain timing and quantity of flows. • Any grading of lands adjacent to natural features should match existing grades at the identified set-back, or buffer from the features. • Control quantity and quality of stormwater discharge using best management practices (e.g. use of a permeable surface for access roads, complete a Stormwater Pollution Prevention Study to address any potential effects associated with stormwater runoff for the Operations and Maintenance Building prior to construction). 	<ul style="list-style-type: none"> • Changes in surface water drainage patterns and obstruction of lateral flows avoided through mitigation measures. • Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> • Inspect locations within 30 m of wetlands following completion of access roads to ensure no grade changes. • Contingency Measures: <ul style="list-style-type: none"> ▪ If surface water drainage alterations are detected, undertake corrective measures to restore drainage pattern.
<p>Operation</p> <ul style="list-style-type: none"> • No effects on Generalized Candidate Significant Wildlife Habitat during operation. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • No effects on Generalized Candidate Significant Wildlife Habitat during operation. 	<ul style="list-style-type: none"> • No monitoring or contingency measures required.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
Seasonal Concentration Areas of Animals					
<p>Waterfowl Stopover and Staging Areas</p> <p>Project infrastructure requiring EIS:</p> <ul style="list-style-type: none"> • Turbines • Project Location in feature <p>Minimum distance to nearest turbine^{**}:</p> <ul style="list-style-type: none"> • WSST-15[*]: 0 m (Turbine 9 is >250 m from the area of seasonal flooding) • WSST-36[*]: 0 m (Turbine 46 is 123 m from the area of seasonal flooding, Turbine 47 is 59 m from the area of seasonal flooding, Turbine 82 is 5 m from the area of seasonal flooding) <p>Project Location in feature^{**}:</p> <ul style="list-style-type: none"> • WSST-15[*] (turbine, collection line) • WSST-36[*] (turbines, access roads, collection lines) <p>^{**}300 m buffer included as habitat when determining distances.</p>	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Disruption of Tundra Swans in stopover and staging habitat due to construction/decommissioning activities. 	<ul style="list-style-type: none"> • Avoid disruption of Tundra Swans during migration. 	<ul style="list-style-type: none"> • Schedule construction activities within 300 m of the stopover and staging habitat to occur outside the important period of staging Tundra Swan (March 1 to April 15). If this is not possible, MNR will be consulted regarding mitigation measures that may be required. • Clearly delineate work area using erosion fencing or similar barrier to avoid accidental damage to staging habitat. • Restore temporary construction areas to pre-construction conditions as soon as possible (e.g. re-vegetate formerly naturally vegetated areas with native plants). 	<ul style="list-style-type: none"> • Disruption to Tundra Swan will be avoided by timing of construction activities. • Negligible residual effects. 	<ul style="list-style-type: none"> • No monitoring or contingency measures required provided construction occurs outside migration period.
	<ul style="list-style-type: none"> • Possible indirect effects on stopover and staging habitat conditions through changes to surface water drainage patterns. 	<ul style="list-style-type: none"> • Minimize changes in surface water drainage patterns. 	<ul style="list-style-type: none"> • Ensure Best Management Practices are used to maintain current drainage patterns, including: <ul style="list-style-type: none"> ▪ Implement infiltration techniques to the maximum extent possible. ▪ Minimize paved surfaces and design roads to promote infiltration. ▪ Limit changes in land contours. 	<ul style="list-style-type: none"> • Habitat damage avoided through maintaining surface water drainage patterns. • Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> • Site inspection by Environmental Monitor following grading activities within 30 m of stopover and staging area. • Contingency Measures: <ul style="list-style-type: none"> ▪ If surface water drainage alterations are detected, undertake corrective measures to restore drainage patterns.
	<p>Operation</p> <ul style="list-style-type: none"> • Avoidance by Tundra Swans of stopover and staging habitat during migration due to proximity of turbines. 	<ul style="list-style-type: none"> • Minimize disturbance or disruption to Tundra Swan stopover and staging habitats. 	<ul style="list-style-type: none"> • Implement mitigation measures if disturbance effects are detected through post-construction monitoring (contingency measure). 	<ul style="list-style-type: none"> • Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> • Conduct 3 years of post-construction Tundra Swan monitoring at Features WSST-15 and WSST-36 (if determined to be significant) by a qualified Biologist, including: <ul style="list-style-type: none"> ▪ Conduct surveys on three occasions approximately one week apart during the peak migratory period, which typically occurs in March but can range from mid-February to mid-April. ▪ One survey station will be placed per 0.5 km of candidate Tundra Swan stopover and staging habitat and be monitored for approximately 15 minutes.

* Mitigation and monitoring commitments will be applied in the event that pre-construction Evaluation of Significance studies determine this feature to be Significant Wildlife Habitat. If pre-construction Evaluation of Significance studies confirm that this feature is not Significant Wildlife Habitat, the mitigation and monitoring commitments described in the table above will not be applied.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
					<ul style="list-style-type: none"> ▪ All observed waterfowl will be recorded along with their approximate location, age and behaviour. • Report the findings of the Tundra Swan monitoring program to MNR on an annual basis for the first 3 years of operation. • Contingency Measures: <ul style="list-style-type: none"> ▪ If significant declines or disappearance of species is detected, determine whether this is likely to have been caused by the Project. If so, implement corrective measures that are developed through consultation with MNR.
	<ul style="list-style-type: none"> • Disturbance to Tundra Swan stopover and staging habitat due to vehicular traffic on access roads. 	<ul style="list-style-type: none"> • Minimize disturbance or disruption to Tundra Swan stopover and staging habitat. 	<ul style="list-style-type: none"> • Schedule regular (non critical) maintenance activities to occur outside of the important period of staging Tundra Swan (March 1 to April 15), to the extent possible. • Maintain wildlife crossing signs and limit speed of vehicles (30 km/hr) near stopover and staging areas. 	<ul style="list-style-type: none"> • Disturbance effects reduced through mitigation measures. • Operational effects minor (<i>i.e.</i>, no or limited disturbance expected). 	<ul style="list-style-type: none"> • No monitoring or contingency measures required.
<p>Bat Maternity Colonies within 30 m of turbines</p> <p>Project infrastructure requiring EIS:</p> <ul style="list-style-type: none"> • Turbine <p>Minimum distance to nearest turbine:</p> <ul style="list-style-type: none"> • BMC-757: 24 m 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Accidental intrusion into natural features resulting in habitat damage. 	<ul style="list-style-type: none"> • Avoid accidental intrusion into natural features. 	<ul style="list-style-type: none"> • Clearly delineate construction boundaries where construction will occur within 10 m using protective fencing to ensure that construction activities occur outside the habitat boundaries. 	<ul style="list-style-type: none"> • Habitat damage will be avoided through clear delineation of boundaries and protective fencing. • Negligible residual effects. 	<ul style="list-style-type: none"> • Undertake weekly site inspections by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. • Contingency Measures: <ul style="list-style-type: none"> ▪ Repair protective fencing if damaged. ▪ Any damaged trees will be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. ▪ If accidental damage to habitat occurs, habitat restoration will occur using suitable native species.
	<ul style="list-style-type: none"> • Bats may be disturbed by noise from construction. 	<ul style="list-style-type: none"> • Minimize disturbance to bat roosting habitat. 	<ul style="list-style-type: none"> • Schedule construction activities within 30 m of significant bat habitats to daylight hours during the bat maternal period of May 1 to July 31, wherever possible. 	<ul style="list-style-type: none"> • Disturbance will be avoided or minimized through timing of construction. • Construction effects temporary and minor. 	<ul style="list-style-type: none"> • No monitoring or contingency measures required.
	<p>Operation</p> <ul style="list-style-type: none"> • Avoidance caused by turbine lighting. • Bats may be disturbed by noise from operation of turbines. 	<ul style="list-style-type: none"> • Protect bat roosting habitat. 	<ul style="list-style-type: none"> • Propose a lighting scheme that will minimize potential disturbance to bats, while fulfilling Transport Canada requirements. • Implement contingency mitigation measures (as per consultation with MNR) if disturbance effects are detected through post-construction 	<ul style="list-style-type: none"> • Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> • Conduct 3 years of post-construction monitoring for Feature BMC-757 according to protocol described for pre-construction survey (as described in March 2010 Draft version of <i>Bats and Bat Habitats: Guidelines for Wind Power Projects</i>) including: <ul style="list-style-type: none"> ▪ Through the night acoustic monitoring stations to be positioned within 10 m of the potential roost. ▪ Survey same stations as pre-construction survey.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
			monitoring.		<ul style="list-style-type: none"> ▪ Visual monitoring to be conducted at dusk in June. ▪ Acoustic monitoring to begin at dusk and continue for 5 hours, for up to 10 nights, or until roost is confirmed. ▪ Monitoring to occur between June 1 and June 30. • Report the findings of monitoring program to MNR on an annual basis for the first 3 years of operation. • Contingency Measures: <ul style="list-style-type: none"> ▪ Institute changes to turbine operation if disturbance effects are detected through post-construction monitoring. ▪ Consultation with MNR to determine additional contingency measures if necessary.
<p>Bat Maternity Colonies 30 m to 120 m from turbines</p> <p>Project infrastructure requiring EIS:</p> <ul style="list-style-type: none"> • Turbine <p>Minimum distance to nearest turbine:</p> <ul style="list-style-type: none"> • BMC-189: 41 m • BMC-229: 43 m • BMC-235*: 32 m • BMC-242*: 56 m • BMC-249*: 116 m • BMC-267*: 43 m • BMC-282*: 106 m • BMC-285*: 83 m • BMC-326: 37 m • BMC-342: 117 m • BMC-352*: 102 m • BMC-358*: 77 m • BMC-372*: 59 m 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Accidental intrusion into natural features resulting in habitat damage. <p>• Bats may be disturbed by noise from construction.</p> <p>Operation</p> <ul style="list-style-type: none"> • Avoidance caused by turbine lighting. • Bats may be disturbed by noise from operation of turbines. 	<ul style="list-style-type: none"> • Avoid accidental intrusion into natural features. • Minimize disturbance to bat roosting habitat. • Protect bat roosting habitat. 	<ul style="list-style-type: none"> • Clearly delineate habitat boundaries where construction will occur within 10 m using protective fencing to ensure that construction activities occur outside the habitat boundaries. • Schedule construction activities within 30 m of significant bat habitats to daylight hours during the bat maternal period of May 1st to July 31st, wherever possible. • Propose a lighting scheme that will minimize potential disturbance to bats, while fulfilling Transport Canada requirements. • Implement contingency mitigation measures (as per consultation with MNR) if disturbance effects are detected through post-construction monitoring. 	<ul style="list-style-type: none"> • Habitat damage will be avoided through clear delineation of boundaries and protective fencing. • Negligible residual effects. • Disturbance will be avoided or minimized through timing of construction. • Construction effects temporary and minor. • Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> • Undertake weekly site inspections by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. • Contingency Measures: <ul style="list-style-type: none"> ▪ Repair protective fencing if damaged. ▪ Any damaged trees will be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. ▪ If accidental damage to habitat occurs, habitat restoration will occur using suitable native species. • No monitoring or contingency measures required. • Conduct 3 years of post-construction monitoring for Features BMC-189, BMC-229, BMC-326, and BMC-342 according to protocol described for pre-construction survey (as described in March 2010 Draft version of <i>Bats and Bat Habitats: Guidelines for Wind Power Projects</i>) (see above). • Conduct 3 years of post-construction monitoring for Features BMC-235, BMC-242, BMC-249, BMC-267, BMC-282, BMC-352 and BMC-358 (if deemed to be significant) according to protocol described for pre-construction survey (as described in July 2011 version of <i>Bats and Bat Habitats: Guidelines for Wind Power Projects</i>) including: <ul style="list-style-type: none"> ▪ Conduct monitoring of roost trees during exit surveys throughout June.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
					<ul style="list-style-type: none"> ▪ Conduct active visual and acoustic monitoring at the cavity opening or crevice from 30 minutes before dusk until 60 minutes after dusk in June. • The findings of all monitoring programs will be reported back to MNR on an annual basis for the first 3 years of operation. • Contingency Measures: <ul style="list-style-type: none"> ▪ Institute changes to turbine operation if disturbance effects are detected through post-construction monitoring. ▪ Consultation with MNR to determine additional contingency measures if necessary.
<p>Bat Maternity Colonies where vegetation removal is proposed</p> <p>Project infrastructure requiring EIS:</p> <ul style="list-style-type: none"> • Project Location in feature <p>Project Location overlaps feature:</p> <ul style="list-style-type: none"> • BMC-648* (transmission line) • BMC-720* (transmission line) 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Displacement and/or mortality of nursing female and juvenile bats. • Removal of confirmed significant cavity trees or other suitable, but not studied, cavity trees. 	<ul style="list-style-type: none"> • No displacement and/or mortality of nursing female and juvenile bats. • Maintain sufficient clusters of cavity trees within the woodland for ongoing bat maternity colony habitat use. 	<ul style="list-style-type: none"> • Identify locations of cavity trees within the bat maternity colony habitat and ensure clusters of cavity trees will remain present within the habitat after tree removal is complete. A "cluster" is defined based on relative cavity tree density within a habitat. BMC-648 was surveyed to contain a relatively high cavity tree density (18.0 cavity trees/ha) therefore a cluster is defined as 4 suitable cavity trees within any 0.05ha circular area (12.6m in radius). BMC-720 was surveyed to contain a lower cavity tree density, at 10.00 cavity trees/ha, and therefore a cluster is defined as 3 suitable cavity trees within any 0.05ha circular area (12.6m in radius). If this mitigation measure is not possible, MNR will be consulted regarding mitigation measures that may be required. • Prepare a tree preservation plan which identifies specific trees to be removed and whether each tree contains a cavity suitable for potential use as a bat maternity colony. • Schedule tree removal to occur outside of the bat maternal period 	<ul style="list-style-type: none"> • Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> • Supervision of tree removal by a qualified Environmental Monitor. • Contingency Measures <ul style="list-style-type: none"> ▪ Any damaged trees will be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
			of May 1 to July 31, wherever possible. If this is not possible, MNR will be consulted regarding mitigation measures that may be required. <ul style="list-style-type: none"> Restoration of habitat temporarily disturbed during construction using suitable native tree species, if possible. 		
	<ul style="list-style-type: none"> Noise disturbance and/or avoidance behaviour during construction. 	<ul style="list-style-type: none"> Minimize noise disturbance and/or avoidance behaviour during construction. 	<ul style="list-style-type: none"> Schedule tree removal to occur outside of the bat maternal period of May 1 to July 31, wherever possible. If this is not possible, MNR will be consulted regarding mitigation measures that may be required. Schedule tree removal to occur during daylight hours. 	<ul style="list-style-type: none"> Disturbance avoided through timing of construction activities. No residual effects anticipated. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.
	<p>Operation</p> <ul style="list-style-type: none"> Disturbance and/or avoidance behaviour during operation. 	<ul style="list-style-type: none"> Continued use of habitat. 	<ul style="list-style-type: none"> Post-construction monitoring to ensure continued use of habitat. 	<ul style="list-style-type: none"> Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> Conduct 3 years of post-construction monitoring of all remaining cavity trees for Features BMC-648 and BMC-720 (if deemed to be significant) according to protocol described for pre-construction survey (as described in July 2011 version of <i>Bats and Bat Habitats: Guidelines for Wind Power Projects</i>) including: <ul style="list-style-type: none"> Conduct monitoring of roost trees through exit surveys through June. Conduct active visual and acoustic monitoring at the cavity opening or crevice from 30 minutes before dusk until 60 minutes after dusk in June. The findings of all post-construction monitoring programs will be reported back to MNR on an annual basis for the first 3 years of operation. Contingency Measures: <ul style="list-style-type: none"> If a permanent and significant disturbance has been noted within these Features, the MNR will be contacted to determine whether additional mitigation measures will be needed.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
<p>Turtle Wintering Areas</p> <p>Project Infrastructure requiring EIS:</p> <ul style="list-style-type: none"> • Access roads <p>Minimum distance to nearest access road:</p> <ul style="list-style-type: none"> • TOW-01*: 11 m • TOW-03*: 59 m 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Accidental intrusion into natural features resulting in habitat damage. 	<ul style="list-style-type: none"> • Avoid accidental intrusion into habitat. 	<ul style="list-style-type: none"> • Clearly delineate habitat boundaries within 10 m of the habitat boundary using protective fencing to ensure that construction activities occur outside the habitat boundaries. 	<ul style="list-style-type: none"> • Disruption to turtle wintering habitats avoided through habitat delineation and fencing. • Negligible residual effects. 	<ul style="list-style-type: none"> • Undertake weekly site inspections by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. • Contingency Measures: <ul style="list-style-type: none"> ▪ Repair protective fencing if damaged. ▪ Consultation with MNR to determine additional contingency measures if necessary.
	<ul style="list-style-type: none"> • Disruption or possible mortality of turtles moving between wintering ponds and other areas. 	<ul style="list-style-type: none"> • Minimize disruption to turtle movement. 	<ul style="list-style-type: none"> • Fence area as far from pond and as close to proposed road as possible. • Post speed limits (30 km/hr) and turtle crossing signage along relevant construction access roads. • To avoid collisions with turtles, schedule construction activities within 30 m to occur during daylight hours and not during the period of emergence (March 15 to May 31). If construction must occur during this timing window, conduct area searches for turtles daily prior to construction activities. 	<ul style="list-style-type: none"> • Disruption and/or mortality minimized through construction timing and speed limits. • Low likelihood of occurring and limited magnitude. 	<ul style="list-style-type: none"> • If construction occurs within 30 m of a turtle wintering area (if determined to be significant) between March 15 and May 31, conduct area searches for turtles by a qualified Biologist prior to soil stripping or grubbing, as well as daily prior to construction activities by the Contractor within the construction footprint. • Contingency Measures: <ul style="list-style-type: none"> ▪ Turtles encountered within the construction area will be moved to a safe location (nearby pond) under the direction of the Environmental Monitor or a qualified Biologist.
	<ul style="list-style-type: none"> • Increased erosion and sedimentation resulting from clearing and grubbing, backfilling and stockpiling. 	<ul style="list-style-type: none"> • Minimize erosion and sedimentation in wintering pond. 	<ul style="list-style-type: none"> • Install sediment and erosion control fencing along edge of construction area if within 30 m of habitat feature as per Ontario Provincial Standards Specifications (OPSD 219.130). 	<ul style="list-style-type: none"> • Erosion and sedimentation mitigated through sediment and erosion control fencing. • Moderate likelihood; if erosion and sedimentation occur, negative effects may be measurable but would likely represent a small change relative to existing conditions. 	<ul style="list-style-type: none"> • Monitor on-site conditions (i.e., erosion and sediment control, spills, flooding, etc.) by an Environmental Monitor where construction occurs within 30 m of a feature on the following basis: <ul style="list-style-type: none"> ▪ Weekly during active construction periods; ▪ Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (i.e., spring freshet); ▪ Daily during extended rain or snowmelt periods; ▪ Monthly during inactive construction periods, if the site is left alone for 30 days or longer. • Contingency Measures: <ul style="list-style-type: none"> ▪ Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place (e.g. install the extra erosion and sediment control materials kept on site, such as heavy duty silt fencing, straw bales, etc.).

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<ul style="list-style-type: none"> Possible indirect effects on wintering pond condition through changes to surface water drainage patterns. 	<ul style="list-style-type: none"> Minimize indirect effects on pond through changes in surface water drainage patterns. 	<ul style="list-style-type: none"> Ensure no grade changes within 30 m of pond. 	<ul style="list-style-type: none"> Indirect effects to habitat minimized by maintaining grade. Low likelihood of occurring and limited magnitude. 	<ul style="list-style-type: none"> Inspect locations following completion of access roads by an Environmental Monitor to ensure no grade changes. Monitor condition of the pond during on-site monitoring events at frequency described for sediment and erosion control. Contingency Measures: <ul style="list-style-type: none"> If surface water drainage alterations are detected, undertake corrective measures to restore drainage pattern.
	<p>Operation</p> <ul style="list-style-type: none"> Risk of road mortality to turtles moving between wintering ponds and other areas. 	<ul style="list-style-type: none"> Minimize turtle mortality along access roads. 	<ul style="list-style-type: none"> Maintain wildlife crossing signs and limit speed of vehicles (30 km/hr) near turtle wintering areas. 	<ul style="list-style-type: none"> Risk of turtle road mortality reduced through mitigation measures. Low likelihood of occurring and limited magnitude due to limited volume of maintenance vehicles. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.
<p>Reptile Hibernacula</p> <p>Project Infrastructure requiring EIS:</p> <ul style="list-style-type: none"> Turbine Access roads <p>Minimum distance to nearest turbine^{**}:</p> <ul style="list-style-type: none"> RH-01*: >120 m RH-02*: 25 m RH-03*: 8 m RH-04*: >120 m RH-05*: 22 m RH-06*: >120 m RH-07*: >120 m RH-08*: >120 m <p>Minimum distance to nearest access road^{**}:</p> <ul style="list-style-type: none"> RH-01*: 86 m RH-02*: 106 m RH-03*: 89 m RH-04*: >120 m RH-05*: 81 m 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> Accidental intrusion into natural feature (e.g. rock pile) resulting in habitat damage. 	<ul style="list-style-type: none"> Avoid accidental intrusion into natural feature. Avoid damage to rock pile(s). 	<ul style="list-style-type: none"> Clearly delineate habitat boundaries where construction will occur within 10 m using protective fencing to ensure that construction activities occur outside the natural feature and avoid direct disturbance to the feature (e.g. rock pile). Avoid excavation within 30 m of the rock pile or foundation. Where avoidance is not possible, collection lines will be installed above-ground within 30 m of the rock pile (RH-04, RH-05 and RH-08). Collection line poles (RH-04, RH-05 and RH-08), transmission line poles (RH-06 and RH-07) and turbine construction disturbance areas (RH-02 and RH-03) will be set back at least 30 m from the rock pile or foundation. 	<ul style="list-style-type: none"> Habitat damage will be avoided and mortality minimized through clear habitat delineation. Negligible residual effects. 	<ul style="list-style-type: none"> Undertake weekly site inspections by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. Contingency Measures: <ul style="list-style-type: none"> Repair protective fencing if damaged. Consultation with MNR to determine additional contingency measures if necessary.
	<ul style="list-style-type: none"> Possible mortality from construction equipment. 	<ul style="list-style-type: none"> Avoid mortality from equipment. 	<ul style="list-style-type: none"> Schedule construction activities within 30 m of the hibernaculum to avoid timing windows during which snakes emerge (April 1 - May 15) and return (September 1 – October 15) to hibernacula. 	<ul style="list-style-type: none"> Mortality minimized through construction timing or drift fencing. Low likelihood of occurring and limited magnitude (i.e., no or 	<ul style="list-style-type: none"> If construction occurs within 30 m of a reptile hibernaculum (if determined to be significant) between April 15 and May 31 or between September 1 and October 15, conduct area searches for snakes by a qualified Biologist prior to soil stripping or grubbing, as well as daily prior to construction activities by the

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
<ul style="list-style-type: none"> RH-06*: >120 m RH-07*: >120 m RH-08*: >120 m <p>Project Location overlaps feature (no infrastructure is proposed within physical hibernaculum structures such as rock piles)**:</p> <ul style="list-style-type: none"> RH-04* (stone pile is 10 m from collection line) RH-05* (rock pile is 11 m from collection line) RH-06* (foundation is 27 m from transmission line) RH-07* (rock pile is >0.1 m from transmission line) RH-08* (rock pile is 16 m from collection line) <p>**30 m buffer included as habitat when determining distances.</p>	<p>Operation</p> <ul style="list-style-type: none"> Possible mortality from vehicles using access roads near features RH-01, RH-02, RH-03 and RH-05. 	<ul style="list-style-type: none"> Minimize snake mortality along access road. 	<ul style="list-style-type: none"> If construction must take place within 30 m of hibernacula during these timing windows: <ul style="list-style-type: none"> Erect temporary drift fence where within 30 m; and Conduct area searches for snake species within the construction area daily prior to construction activities. Advise operations staff to take extra care while driving access roads near features RH-01, RH-02, RH-03 and RH-05, particularly during timing windows when snakes emerge (April 15 - May 31) and return (September 1 – October 15) to hibernacula. Maintain wildlife crossing signs and limit speed of vehicles near crossings (30 km/hr). Erect long term drift fence between edge of habitat (RH-02, RH-03, RH-04 and RH-05) and road if hibernaculum determined to be large (>25 snakes). 	<p>limited mortality expected).</p> <ul style="list-style-type: none"> Risk of snake mortality minimized through the application of mitigation measures. Low likelihood of occurring and limited magnitude (<i>i.e.</i>, no or limited mortality expected) due to limited volume of maintenance vehicles. 	<p>Contractor within the construction footprint.</p> <ul style="list-style-type: none"> Weekly inspection of drift fence while construction is occurring during specified timing windows. Contingency Measures: <ul style="list-style-type: none"> Snakes encountered within the construction area will be moved to a safe location under the direction of the Environmental Monitor or a qualified Biologist. <p>• Conduct reptile hibernacula surveys at reptile hibernacula within 120 m of access roads (RH-01, RH-02, RH-03 and RH-05; if determined to be significant) by a qualified Biologist annually for 3 years post-construction to assess any potential changes in snake populations or species composition using protocol described for pre-construction survey, including:</p> <ul style="list-style-type: none"> Examination of rock piles and vicinity on three occasions between mid-April and mid-May. Identify species and count individuals. <p>• Report the findings of the reptile hibernacula monitoring program to MNR on an annual basis for the first 3 years of operation.</p> <p>• Contingency Measures:</p> <ul style="list-style-type: none"> If significant declines or disappearance of species is detected, determine whether likely to have been caused by the Project. If so, corrective measures will be taken, to be determined through consultation with MNR.
<p>Colonially-nesting Bird Breeding Habitat (Tree/Shrub)</p> <p>Project Infrastructure requiring EIS:</p> <ul style="list-style-type: none"> Project Location in feature <p>Project Location overlaps feature (no infrastructure is proposed within the woodland)**:</p> <ul style="list-style-type: none"> CNB-01 (Turbines 55 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> Noise disturbance and/or avoidance behaviour during construction. <p>Operation</p> <ul style="list-style-type: none"> Colonially-nesting birds may be disturbed by noise from operation of turbines. 	<ul style="list-style-type: none"> Minimize disturbance to colonially-nesting birds (Great Blue Herons). Minimize disturbance to colonially-nesting birds (Great Blue Herons). 	<ul style="list-style-type: none"> Schedule construction activities within 120 m (of 300 m buffer) to occur outside the sensitive breeding period of March 15 to August 1. If this is not possible, MNR will be consulted regarding mitigation measures that may be required. Post-construction monitoring to ensure continued use of the habitat. 	<ul style="list-style-type: none"> Disturbance to colonially-nesting birds will be avoided through construction timing. Negligible residual effects. Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> No monitoring or contingency measures required. Include Turbines 55 and 56 in post-construction mortality monitoring program (refer to Table 5.4). Conduct a pre-construction survey in the spring during leaf-off to gather more information about the heronry (e.g. number and location of additional nests), following the protocol described below.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
<p>and 56, access roads, collection lines are >114 m from the heronry)</p> <p>**300 m buffer included as habitat when determining distances.</p>					<ul style="list-style-type: none"> • Conduct 3 years of post-construction colonially-nesting bird monitoring at feature CNB-01 by a qualified Biologist, including: <ul style="list-style-type: none"> ▪ Conduct surveys on two occasions per year, in April and June. ▪ At least one vantage point/listening station will be placed along the fence line north of Turbine 56 and be monitored for approximately 15 minutes. ▪ All observed (including heard) colonially-nesting birds will be recorded along with their approximate location, age and behaviour, if possible. • Report the findings of the colonially-nesting bird monitoring program to MNR on an annual basis for the first 3 years of operation. • Contingency Measures: <ul style="list-style-type: none"> ▪ If significant declines or disappearance of species is detected, determine whether this is likely to have been caused by the Project. Monitoring results will be discussed with MNR prior to implementing mitigation measures, which will be developed through consultation with MNR.
<p>Deer Winter Congregation Areas</p> <p>Project Infrastructure requiring EIS:</p> <ul style="list-style-type: none"> • Access road <p>Minimum distance to nearest access road:</p> <ul style="list-style-type: none"> • DWC-01: 31 m 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Noise disturbance and/or avoidance behaviour during construction. 	<ul style="list-style-type: none"> • Minimize disturbance to wintering deer. 	<ul style="list-style-type: none"> • Schedule construction activities within 120 m to occur before December 1 or after March 31 when the snow depth is greater than 20 cm or there is evidence of yarding. • In years where environmental conditions are not favorable for yarding, contact MNR to determine if construction activities may proceed between December 1 and March 31. 	<ul style="list-style-type: none"> • Disturbance to wintering deer will be minimized through construction timing. • Negligible residual effects. 	<ul style="list-style-type: none"> • No monitoring or contingency measures required if construction does not occur between December 1 and March 31. • If construction is scheduled to occur between December 1 and March 31, undertake survey to determine snow depth and evidence of yarding (e.g. concentrations of tracks) by a qualified Biologist. Contact MNR to determine if construction activities may proceed.
	<p>Operation</p> <ul style="list-style-type: none"> • No effects on feature anticipated during operation. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • No effects on features. 	<ul style="list-style-type: none"> • No monitoring or contingency measures required.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
Specialized Habitat for Wildlife					
Amphibian Woodland Breeding Habitat within 120 m of access roads Minimum distance to nearest access road: <ul style="list-style-type: none"> • AWO-02: >0.1 m • AWO-14: 21 m • AWO-25: 37 m • AWO-27: 11 m • AWO-30: 10 m 	Construction/Decommissioning <ul style="list-style-type: none"> • Accidental intrusion into natural features resulting in habitat damage. 	<ul style="list-style-type: none"> • Avoid accidental intrusion into habitat. 	<ul style="list-style-type: none"> • Clearly delineate habitat boundaries where construction will occur within 30 m using protective fencing to ensure that construction activities occur outside the habitat boundaries. 	<ul style="list-style-type: none"> • Disruption to amphibian habitats avoided through habitat delineation and fencing. • Negligible residual effects. 	<ul style="list-style-type: none"> • Undertake weekly site inspections by an Environmental Monitor to ensure that protective fencing is intact and that there is no damage caused during construction. • Contingency Measures: <ul style="list-style-type: none"> ▪ Repair protective fencing if damaged. ▪ Any damaged trees will be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. ▪ If accidental damage to habitat occurs, habitat restoration will occur within the disturbed area using suitable native species.
	<ul style="list-style-type: none"> • Disruption or possible mortality of amphibians moving between breeding pools and home range. 	<ul style="list-style-type: none"> • Minimize disruption to amphibians. 	<ul style="list-style-type: none"> • Limit construction of roads within 30 m of significant amphibian habitats to daylight hours between April 1st and June 30th (for significant frog breeding habitats) or between March 15th and April 30th (for significant salamander breeding habitat), to avoid excessive noise and vehicle caused mortality, wherever possible. • Post speed limits along construction access roads (30 km/hr). 	<ul style="list-style-type: none"> • Disruption mitigated through construction timing and speed limits. • Low likelihood of occurring and limited magnitude (<i>i.e.</i>, no or limited mortality expected). 	<ul style="list-style-type: none"> • No monitoring required if timing windows are applied. • If construction occurs within 30 m of amphibian breeding habitat (if determined to be significant) after dark within the specified timing windows, amphibian mortality surveys will be conducted the following day by a qualified Biologist. • Contingency Measures: <ul style="list-style-type: none"> ▪ Restrict work to daylight hours if significant amphibian mortality is detected through mortality surveys.
	<ul style="list-style-type: none"> • Increased erosion and sedimentation resulting from clearing and grubbing, backfilling and stockpiling. 	<ul style="list-style-type: none"> • Minimize erosion and sedimentation to breeding habitat. 	<ul style="list-style-type: none"> • Install sediment and erosion control fencing along edge of construction area if within 30 m of habitat feature as per Ontario Provincial Standards Specifications (OPSD 219.130). 	<ul style="list-style-type: none"> • Erosion and sedimentation mitigated through sediment and erosion control fencing. • Moderate likelihood; if erosion and sedimentation occur negative effects may be measurable but would likely represent a small change relative to existing conditions. 	<ul style="list-style-type: none"> • Monitor on-site conditions (<i>i.e.</i>, erosion and sediment control, spills, flooding, etc.) by an Environmental Monitor where construction occurs within 30 m of a feature on the following basis: <ul style="list-style-type: none"> ▪ Weekly during active construction periods; ▪ Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (<i>i.e.</i>, spring freshet); ▪ Daily during extended rain or snowmelt periods; ▪ Monthly during inactive construction periods, where the site is left alone for 30 days or longer. • Contingency Measures: <ul style="list-style-type: none"> ▪ Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place (e.g. install the extra erosion and sediment control materials kept on site, such as heavy duty silt fencing, straw bales, etc.).

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<ul style="list-style-type: none"> Possible indirect effects on breeding pool condition through changes to surface water drainage patterns. 	<ul style="list-style-type: none"> Minimize indirect effects on breeding pools. 	<ul style="list-style-type: none"> Ensure no grade changes within 30 m of breeding pools. 	<ul style="list-style-type: none"> Indirect effects to habitat minimized by maintaining grade. Low likelihood of occurring and limited magnitude. 	<ul style="list-style-type: none"> Inspect locations following completion of access roads by an Environmental Monitor to ensure no grade changes. Examine condition of vernal pools or ponds within 30 m of access road following completion of construction. Contingency Measures: <ul style="list-style-type: none"> If surface water drainage alterations are detected, undertake corrective measures to restore drainage pattern.
	<p>Operation</p> <ul style="list-style-type: none"> Risk of road mortality to amphibians moving between breeding pools and home range. 	<ul style="list-style-type: none"> Minimize amphibian mortality along access roads. 	<ul style="list-style-type: none"> Advise operations staff to avoid driving roads in proximity to these features at night between April 1 and June 30, and any rainy nights from spring to early autumn, wherever possible. Most access road traffic will be confined to daytime hours. Avoid access road use at night. Maintain wildlife crossing signs and limit speed of vehicles near crossings (30 km/hr). 	<ul style="list-style-type: none"> Risk of amphibian mortality reduced through mitigation measures. Low likelihood of mortality due to infrequent use of access roads by maintenance vehicles. 	<ul style="list-style-type: none"> Conduct 3 years post-construction amphibian call surveys (frogs and toads) and egg mass or adult surveys (salamanders) to assess any potential changes in amphibian breeding populations or species distribution (if features determined to be significant) at features AWO-02, AWO-14, AWO-25, AWO-27 and AWO-30) by a qualified Biologist, including: <ul style="list-style-type: none"> Call surveys at each Feature three times between April 1 and June 30, as per the Marsh Monitoring Protocol. Conduct surveys between one half-hour after sunset and 2:00 am and, to the extent possible, on nights that are clear, cloudy, damp, foggy, or have light rain and minimum night air temperatures of 5°C, 10°C and 14°C for each of the three respective survey periods. Complete a 3-minute listening survey at each station. Conduct surveys to target non-vocalizing amphibians (<i>i.e.</i>, salamanders) using one of the following three protocols: <ul style="list-style-type: none"> Nocturnal survey for adult salamanders in late March to early April; Surveys for salamander egg masses on two occasions in March and April; Surveys for larval salamanders in May or June. Report the findings of post-construction monitoring to MNR on an annual basis for the first 3 years of operation. Contingency Measures: <ul style="list-style-type: none"> If significant declines or disappearance of species is detected, determine whether likely to have been caused by the Project. If so, corrective measures will be taken, to be determined through consultation with MNR.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
<p>Amphibian Woodland Breeding Habitat where vegetation removal is proposed</p> <p>Project Location in feature:</p> <ul style="list-style-type: none"> • AWO-33* (transmission line) • AWO-34* (transmission line) • AWO-35* (transmission line) 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Removal of vegetation for construction of transmission line within significant feature resulting in habitat damage. 	<ul style="list-style-type: none"> • Minimize disturbance to amphibian breeding habitat. • No destruction of breeding pond. 	<ul style="list-style-type: none"> • Clearing of vegetation will not take place between April 1 and June 30. If this is not possible, MNR will be consulted regarding mitigation measures that may be required. • Schedule construction activities within the woodland to outside April 1st and June 30th (for significant frog breeding habitats) or March 15th and April 30th (for significant salamander breeding habitat), to avoid disturbance to breeding amphibians and vehicle caused mortality. Work within 30 m of amphibian breeding habitats will not occur after dusk during the breeding season (as above). If this is not possible, MNR will be consulted regarding mitigation measures that may be required. • Maintain a 10 m buffer around the breeding pond within which no vegetation removal will occur, where possible. Install wildlife fencing (sediment fencing) prior to any earth movement, stockpiling or other activities on the site, to prevent any impact or disturbance to the breeding pool or pond. • Minimize the area of tree removal within the natural area to the extent possible. • Re-vegetate temporarily disturbed areas as soon as possible after construction activities are complete using species native to Ontario in naturally vegetated areas. 	<ul style="list-style-type: none"> • Some permanent vegetation removal within woodlands containing amphibian breeding habitat will occur. Breeding habitat should remain undisturbed. • Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> • Monitor condition of the pond during on-site monitoring events at frequency described for sediment and erosion control. • Contingency Measures: • If negative effects to the pond are detected based on the results of post-construction monitoring, corrective measures will be taken, to be determined through consultation with MNR. These habitat compensation or restoration measures will be described in a Compensation Plan, to be submitted to MNR.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<ul style="list-style-type: none"> Disruption or possible mortality of amphibians moving between breeding pools and home range. 	<ul style="list-style-type: none"> Minimize disruption to amphibians. 	<ul style="list-style-type: none"> Schedule construction activities within the woodland to outside April 1 and June 30 (for significant frog breeding habitats) or March 15 and April 30 (for significant salamander breeding habitat), to avoid disturbance to breeding amphibians and vehicle caused mortality. Work within 30 m of amphibian breeding habitats will not occur after dusk during the breeding season (as above). If this is not possible, MNR will be consulted regarding mitigation measures that may be required. Post speed limits along construction access roads (30 km/hr). 	<ul style="list-style-type: none"> Disruption mitigated through construction timing and speed limits. Low likelihood of occurring and limited magnitude (<i>i.e.</i>, no or limited mortality expected). 	<ul style="list-style-type: none"> No monitoring or contingency measures required if timing windows are applied. If construction occurs within 30 m of an amphibian breeding habitat (if determined to be significant) between April 1 and June 30, conduct area searches for amphibians by a qualified Biologist prior to soil stripping or grubbing.
	<ul style="list-style-type: none"> Increased erosion and sedimentation resulting from clearing and grubbing, backfilling and stockpiling. 	<ul style="list-style-type: none"> No disturbance to breeding amphibians. No destruction (including erosion and sedimentation) of breeding sites. 	<ul style="list-style-type: none"> Install sediment and erosion control fencing along edge of construction area if within 30 m of habitat feature as per Ontario Provincial Standards Specifications (OPSD 219.130). Remove trees by hand-held equipment and drag them out of the natural area to minimize soil disturbance. Lighter vehicles and lighter machinery should be used in and around the natural area. Any vehicles used within the natural area should have wide-based tires. Tracked vehicles should be avoided. Re-vegetate disturbed areas as soon as possible after construction activities are complete using species native to Ontario in naturally vegetated areas. 	<ul style="list-style-type: none"> Erosion and sedimentation mitigated through sediment and erosion control fencing. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Fencing must be keyed in correctly and monitored for proper installation and maintenance by an Environmental Monitor. Monitor on-site conditions (<i>i.e.</i>, erosion and sediment control, spills, flooding, etc.) by an Environmental Monitor where construction occurs within 30 m of a feature on the following basis: <ul style="list-style-type: none"> Weekly during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (<i>i.e.</i>, spring freshet); Daily during extended rain or snowmelt periods; Monthly during inactive construction periods, where the site is left alone for 30 days or longer. Contingency Measures: <ul style="list-style-type: none"> Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place (e.g. install the extra erosion and sediment control materials kept on site, such as heavy duty silt fencing, straw bales, etc).

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<ul style="list-style-type: none"> Possible indirect effects on breeding pool condition through changes to surface water drainage patterns. 	<ul style="list-style-type: none"> Minimize indirect effects on breeding pools through changes to surface water drainage patterns. 	<ul style="list-style-type: none"> Ensure no grade changes within 30 m of breeding pools. 	<ul style="list-style-type: none"> Indirect effects to habitat minimized by maintaining grade. Low likelihood of occurring and limited magnitude. 	<ul style="list-style-type: none"> Inspect locations following completion of construction by an Environmental Monitor to ensure no grade changes. Monitor condition of vernal pools or ponds during on-site monitoring events at frequency described for sediment and erosion control. Contingency Measures: <ul style="list-style-type: none"> If negative effects to the pond are detected, corrective measures will be taken, to be determined through consultation with MNR. These habitat compensation or restoration measures will be described in a Compensation Plan, to be submitted to MNR.
	<p>Operation</p> <ul style="list-style-type: none"> Breeding amphibians may be disturbed by routine maintenance of transmission line corridor. 	<ul style="list-style-type: none"> Minimize disturbance due to maintenance activities. 	<ul style="list-style-type: none"> Advise operations staff to avoid, where possible, maintenance activities in proximity to these features between April 1 and June 30 (for significant frog breeding habitats) or between March 15 and April 30 (for significant salamander breeding habitat), and any rainy nights from spring to early autumn. Conduct area searches for amphibians prior to beginning maintenance activities if required to take place within the above timing windows. 	<ul style="list-style-type: none"> Risk of disturbance reduced through mitigation measures, including maintenance timing. Low likelihood of occurring and limited magnitude of residual effects 	<ul style="list-style-type: none"> Conduct 3 years post-construction amphibian call surveys (frogs and toads) and egg mass or adult surveys (salamanders) to assess any potential changes in amphibian breeding populations or species distribution (if Features deemed to be significant), including: <ul style="list-style-type: none"> Call surveys at each Feature three times between April 1st and June 30th, as per the <i>Marsh Monitoring Protocol</i>. Conduct surveys between one half-hour after sunset and 2:00 am and, to the extent possible, on nights that are clear, cloudy, damp, foggy, or have light rain and minimum night air temperatures of 5°C (41°F), 10°C (50°F) and 14°C (57°F) for each of the three respective survey periods. Complete a 3-minute listening survey at each station. Conduct surveys to target non-vocalizing amphibians (i.e., salamanders) using one of the following three protocols: <ul style="list-style-type: none"> Nocturnal survey for adult salamanders in late March to early April; Surveys for salamander egg masses on two occasions in March and April; Surveys for larval salamanders in May or June. The findings of post-construction monitoring will be reported back to MNR on an annual basis for the first 3 years of operation. Contingency Measures <ul style="list-style-type: none"> If significant declines or disappearance of species is detected, determine whether likely to have been caused by the project. If so, corrective measures will be taken, to be determined through consultation with MNR. Habitat compensation or restoration measures will be described in a Compensation Plan, to be submitted to MNR.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<ul style="list-style-type: none"> Risk of mortality to amphibians moving between breeding pools and home range. Removal of vegetation within amphibian woodland breeding habitats resulting from clearing for transmission line. 	<ul style="list-style-type: none"> No amphibian mortality due to maintenance activities. Minimize disturbance to amphibian breeding habitat. No destruction of breeding pond. 	<ul style="list-style-type: none"> Advise operations staff to avoid, where possible, maintenance activities in proximity to these features between April 1st and June 30th (for significant frog breeding habitats) or between March 15th and April 30th (for significant salamander breeding habitat), and any rainy nights from spring to early autumn. Maintain wildlife crossing signs and limit speed of vehicles near crossings (30 km/hr). Schedule vegetation clearing within the woodland to outside April 1 and June 30. Implement contingency mitigation measures (as per consultation with MNR) if disturbance effects are detected through construction monitoring. 	<ul style="list-style-type: none"> Risk of amphibian mortality reduced through maintenance timing. Low likelihood of occurring and limited magnitude of residual effects. Some permanent vegetation removal within woodlands containing amphibian breeding habitat will occur. Breeding pond should remain undisturbed. Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> No monitoring or contingency measures required. Conduct 3 years post-construction amphibian call surveys (frogs and toads) and egg mass or adult surveys (salamanders) to assess any potential changes in amphibian breeding populations or species distribution (if Features deemed to be significant), including: <ul style="list-style-type: none"> Call surveys at each Feature three times between April 1st and June 30th, as per the <i>Marsh Monitoring Protocol</i>. Conduct surveys between one half-hour after sunset and 2:00 am and, to the extent possible, on nights that are clear, cloudy, damp, foggy, or have light rain and minimum night air temperatures of 5°C (41°F), 10°C (50°F) and 14°C (57°F) for each of the three respective survey periods. Complete a 3-minute listening survey at each station. Conduct surveys to target non-vocalizing amphibians (i.e., salamanders) using one of the following three protocols: <ul style="list-style-type: none"> Nocturnal survey for adult salamanders in late March to early April; Surveys for salamander egg masses on two occasions in March and April; Surveys for larval salamanders in May or June. The findings of post-construction monitoring will be reported back to MNR on an annual basis for the first 3 years of operation. Contingency Measures <ul style="list-style-type: none"> If significant declines or disappearance of species is detected, determine whether likely to have been caused by the project. If so, corrective measures will be taken, to be determined through consultation with MNR. Habitat compensation or restoration measures will be described in a Compensation Plan, to be submitted to MNR.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<ul style="list-style-type: none"> Risk of disturbance and/or mortality from herbicide spraying along transmission line. 	<ul style="list-style-type: none"> Minimize disturbance and/or mortality from herbicide spraying. 	<ul style="list-style-type: none"> Minimize aerial extent of herbicide spraying along transmission line. Only apply herbicide when wind speeds are low and no significant precipitation is expected. Maintain 10 m buffer to pond where no herbicides area applied. Apply only herbicides approved for use adjacent to water bodies within riparian buffer areas. Only apply herbicides using hand spraying within riparian buffer areas. A dye solution will be used in herbicide mix to visually detect uniform coverage of spray area. Conduct area searches for amphibians prior to herbicide application. 	<ul style="list-style-type: none"> Risk of amphibian mortality or disturbance reduced through mitigation measures, including minimizing aerial extent of spraying. Low likelihood of occurring and limited magnitude of residual effects. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.
Habitat for Species of Conservation Concern					
<p>Habitat for Plant Species of Conservation Concern</p> <p>Project Infrastructure requiring EIS:</p> <ul style="list-style-type: none"> Access roads <p>Minimum distance to nearest access road:</p> <ul style="list-style-type: none"> SCP-12: >120 m SCP-13: >120 m SCP-14: >120 m SCP-15: >120 m SCP-16: >120 m SCP-17: >120 m 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> No effects to features due to distance (all >120 m from proposed access roads). <p>Operation</p> <ul style="list-style-type: none"> No effects on features anticipated during operation, given distance from access roads. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> None required. 	<ul style="list-style-type: none"> No effects on features. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
<p>Habitat for Bird Species of Conservation Concern (Red-headed Woodpecker)</p> <p>Project Location in feature:</p> <ul style="list-style-type: none"> • SCB-03 (transmission line) 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Removal of vegetation within significant feature resulting in habitat damage. • Breeding Red-headed Woodpecker habitat may be disturbed by noise from construction. 	<ul style="list-style-type: none"> • Minimize disturbance to breeding habitat. • Avoid disturbance to breeding birds. 	<ul style="list-style-type: none"> • Identify locations of cavity trees within the Red-headed Woodpecker habitat and ensure suitable snag trees will remain present within the habitat after vegetation removal is complete. If this is not possible, MNR will be consulted regarding mitigation measures that may be required. • Schedule vegetation clearing within habitat to occur outside the breeding season of May 1 to July 31. • Maintain a 10 m buffer around the nest within which no vegetation removal will occur. • Clearly delineate habitat boundaries (<i>i.e.</i>, 10 m buffer) using protective fencing to ensure that construction activities occur only within prescribed areas. • Minimize the area of tree removal within the natural area to the extent possible. • Nest searches will be conducted by a qualified Biologist prior to vegetation clearing. • Remove trees by hand-held equipment and drag them out of the natural area to minimize soil disturbance. If possible, leave some woody debris to decompose naturally. • Lighter vehicles and lighter machinery should be used in and around the natural area. Any vehicles used within the natural area should have wide-based tires. Tracked vehicles should be avoided. • Use single poles for the transmission line, if possible. 	<ul style="list-style-type: none"> • Some permanent vegetation removal within the woodland containing the Red-headed Woodpecker nest site will occur. • Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> • Supervision of vegetation removal by a qualified Environmental Monitor to limit removal of habitat to the extent possible. • Contingency Measures <ul style="list-style-type: none"> ▪ Prune any damaged trees through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
	<p>Operation</p> <ul style="list-style-type: none"> Red-headed Woodpecker breeding habitat may be disturbed by routine maintenance of transmission line corridor. 	<ul style="list-style-type: none"> No displacement of Red-headed Woodpecker from habitat. No destruction of breeding habitat. 	<ul style="list-style-type: none"> Perform maintenance operations such as vegetation clearing outside the breeding season of May 1 to July 31. Implement contingency mitigation measures (as per consultation with MNR) if disturbance effects are detected through post-construction monitoring. 	<ul style="list-style-type: none"> If routine maintenance operations such as vegetation trimming and clearing are conducted outside the breeding season of May 1st to July 31st there should be minimal residual effects from the maintenance of the transmission line. Nesting in utility poles has been recorded for Red-Headed Woodpecker, thus there is a possibility that the poles could provide future nesting habitat. 	<ul style="list-style-type: none"> Supervision of vegetation removal by a qualified Biologist to ensure no destruction of nesting habitat. No additional monitoring or contingency measures required if timing window is applied.
	<ul style="list-style-type: none"> Absence of vegetation within Red-Headed Woodpecker Breeding Habitat removed during construction of transmission line. 	<ul style="list-style-type: none"> No displacement of breeding Red-headed Woodpeckers from habitat. No destruction of nesting habitat. 	<ul style="list-style-type: none"> Implement contingency mitigation measures (as per consultation with MNR) if disturbance effects are detected through post-construction monitoring. Consideration of Red-headed Woodpecker habitat requirements in development of Compensation Plan for tree removal in significant woodland (refer to Section 5.6). 	<ul style="list-style-type: none"> Some permanent vegetation removal within the woodland containing the Red-Headed Woodpecker nesting site will occur. Significance of residual effects will be determined based on the results of post-construction monitoring. 	<ul style="list-style-type: none"> Conduct 3 years of post-construction monitoring for Feature SCB-03, according to protocol described for pre-construction surveys following the <i>Forest Bird Monitoring Protocol</i> including: <ul style="list-style-type: none"> Point counts within the woodlot on three separate visits during the period of May 15 – July 10. Conduct monitoring and evaluation of Red-Headed Woodpecker nest site to measure the use of the nesting location, and the success of breeding efforts. Examine utility poles for signs of nesting by Red-Headed Woodpecker. The findings of post-construction monitoring will be reported back to MNR on an annual basis for the first 3 years of operation. Contingency Measures <ul style="list-style-type: none"> If significant declines or disappearance of species is detected, determine whether likely to have been caused by the project. If so, corrective measures will be taken, to be determined through consultation with MNR. Habitat compensation or restoration measures will be described in a Compensation Plan, to be submitted to MNR.

Table 5.6 Potential Effects on Significant Wildlife Habitat and Mitigation Measures

Significant Wildlife Habitat	Potential Effects	Performance Objectives	Mitigation Measures	Likelihood and Significance of Residual Effects	Monitoring Plan and Contingency Measures
Animal Movement Corridors					
Deer Movement Corridors Project Infrastructure requiring EIS: • Access road Minimum distance to nearest access road: • WOD-331: 23 m	Construction/Decommissioning • Noise disturbance and/or avoidance behaviour during construction.	• Minimize disturbance to wintering deer.	• Schedule construction activities within 120 m of deer wintering areas to occur before December 1 or after March 31 when the snow depth is greater than 20 cm or there is evidence of yarding. • In years where environmental conditions are not favourable for yarding, contact MNR to determine if construction activities may proceed between December 1 and March 31.	• Disturbance to wintering deer will be minimized through construction timing. • Negligible residual effects.	• No monitoring or contingency measures required if construction does not occur between December 1 and March 31. • If construction is scheduled to occur between December 1 and March 31, undertake survey to determine snow depth and evidence of yarding (e.g. concentrations of tracks) by a qualified Biologist. Contact MNR to determine if construction activities may proceed.
	Operation • Risk of road mortality to deer moving through corridor.	• Minimize road mortality to deer.	• Advise operations staff to avoid driving roads in proximity to this feature at night between November 15 and December 15, and between April 1 and April 30 where possible. • Encourage slow vehicle speeds. Post and maintain speed limit signs (30 km/hr) and wildlife crossing signs on access roads.	• Risk of deer mortality reduced through mitigation measures. • Low likelihood of occurring and limited magnitude due to limited volume of maintenance vehicles.	• No monitoring or contingency measures required.

5.9 Summary and Conclusions

The landscape in the Project Study Area is nearly level and quite intensively cultivated with natural features mostly in the form of remnant woodlands. This landscape configuration has made it possible to derive a layout of turbines and associated infrastructure that largely avoids the natural features. None of the above-ground project infrastructure (turbines, access roads, collection lines, transmission line, operations building and substation) is proposed within significant wetlands. Vegetation clearing for the transmission line will occur in significant natural feature in four locations which include four significant woodlands, two bat maternity colonies, three amphibian woodland breeding habitats, one turtle over-wintering pond, and breeding habitat for a bird species of conservation concern (Red-headed Woodpecker). Strategies to mitigate direct loss and fragmentation will be implemented resulting in moderate significance of residual effects; provided they are applied correctly based on site-specific conditions.

Where turbines, access roads and/or underground lines are proposed in agricultural fields adjacent to significant woodlands, significant wetlands, and Significant Wildlife Habitat, a minimum 5 m buffer from the edge of the feature will be applied in which no physical disturbance will be permitted where the ground is flat or sloping away from the feature and the agriculture is intensive (i.e. row crop). Where the ground is sloping towards the feature and the agriculture is not intensive (i.e. hay field or pasture), significant woodlands and wetlands will have a setback of 30 m applied. All locally significant wetlands and regionally significant ANSIs will have a 5 m setback regardless of the adjacent slope or agriculture. All provincially significant ANSIs will have a 120 m setback, and all waterbodies will have a 30 m setback. This buffer will avoid and mitigate potential negative environmental effects associated with construction and operation of access roads, collection lines, and turbines. Where underground collection lines and the transmission line are proposed along existing road right-of-ways adjacent to significant natural features, all construction activity will occur within the right-of-way in order to avoid intrusion into the features. Site specific mitigation measures (i.e., tree protection fencing) will be implemented to avoid or reduce potential impacts.

Underground collection lines will be installed under significant natural features via directional drilling technique in ten locations. In order to avoid impacts to significant natural features associated with directional drilling, entrance and exit pits will be located a minimum of 30 m away from the feature and no other physical disturbance within the 30 m buffer will be permitted. This buffer will mitigate potential negative environmental effects associated with use of equipment and machinery for the installation of collection lines. Additional site-specific mitigation measures specific to the installation of underground collection lines (i.e., "frac-out" response plan), will be implemented to avoid or reduce potential impacts.

Operational effects of turbines on bird and bat mortality will be monitored for at least 3 years post-construction and, if required, mitigation measures (including operational controls) will be implemented in consultation with MNR and in accordance with provincial guidelines and requirements, as described in *Birds and Bird Habitats: Guidelines for Wind Power Projects* (MNR, 2011h) and *Bats and Bat Habitats: Guidelines for Wind Power Projects* (MNR, 2011e). Operational mitigation measures may include periodic shut-down of select turbines and/or blade feathering at specific times of the year when mortality risks to the affected species is particularly high (e.g., during migration).

Generally, with respect to the proposed Project, the significance of anticipated residual effects is predicted to be low to moderate provided that the recommended mitigation measures are properly implemented and proactively managed throughout the duration of construction and post-construction activities.

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