



Samsung Renewable Energy Inc. and
Pattern Renewable Holdings Canada ULC

Natural Heritage Assessment

Reports Included:

7A - Records Review Report

7B – Site Investigations Report

7C – Evaluation of Significance Report

7D – Environmental Impact Study

For

Armow Wind Project

ARMOW WIND PROJECT **Natural Heritage Assessment**

Prepared for:
Golder Associates Ltd.
2390 Argentia Road
Mississauga, ON L5N 5Z7

Project No. 1275

Date: October 2012



NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

ARMOW WIND PROJECT

Natural Heritage Assessment

Project Team:

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Report submitted on October 26, 2012



Andrew G. Ryckman

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Chapter IV: Natural Heritage Environmental Impact Study Report



Samsung Renewable Energy Inc. and
Pattern Renewable Holdings Canada ULC

**7A Natural Heritage Records
Review Report**

For
Armow Wind Project

Chapter I
Natural Heritage
Records Review Report

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1.0 Project Description

The Armow Wind Project (the “Project”) is an up to 180 megawatt (MW) commercial wind energy generation facility located substantially on leased privately owned lands in the Municipality of Kincardine, Bruce County, Ontario. The Project is being developed by SP Armow Wind Ontario GP Inc., in its capacity as general partner of SP Armow Wind Ontario LP (the “Proponent”). The Proponent is a joint venture limited partnership owned by affiliates of Pattern Renewable Holdings Canada ULC (“Pattern”) and Samsung Renewable Energy Inc. (“Samsung”).

Natural Resource Solutions Inc. (NRSI) was retained in August 2011 by Golder Associates Ltd., on behalf of the Proponent, to conduct a natural environment resource assessment in accordance with the Renewable Energy Approval (REA) Regulation. This report was prepared in accordance with of the Renewable Energy Approval (REA) Regulation (O. Reg. 359/09 of the Environmental Protection Act) and includes a records review, site investigation, evaluation of significance, and impact assessment of any potentially significant natural features at the proposed Armow Wind Project. According to subsection 6(3) of O. Reg. 359/09, the wind component of the Project is classified as a Class 4 Wind Facility. This records review report was prepared in accordance with Section 25 of O. Reg. 359/09 with guidance provided from the *Natural Heritage Assessment Guide for Renewable Energy Projects* (OMNR 2011a). The intent of this section is to identify, verify and document any natural features present at or within 120m of the proposed project location. The analysis of the natural heritage features and biological factors affecting the proposed site is being considered. Other factors, such as water bodies, land ownership, social impacts, and cultural impacts are also being assessed and will be addressed under a separate cover in accordance with O. Reg. 359/09.

The proposed Project is located in Bruce County, within the Municipality of Kincardine in the Province of Ontario. The general project area is roughly bordered by Bruce Road 20 to the north, Highway 9 to the south, Bruce Road 1 to the east, and Highway 21 to the west. This wind energy generating facility is proposed to be 180MW in size, consisting of up to 99 operational wind turbines, as well as supporting infrastructure.

As identified in the O. Reg. 359/09, the proposed layout of the project components is collectively referred to as the 'project location'. In accordance with Section 25 of O. Reg. 359/09, NRSI has conducted a thorough records review of available background resources to identify any potentially significant natural features within 120m of the project location. This includes areas within 120m of turbine blade tip as well as any areas that may be used as temporary lay-down areas, crane pads, access roads, substation locations, permanent meteorological (MET) towers, and connector, distribution, and transmission lines. For the purposes of this report, NRSI will refer to the areas within 120m of the project location as the 'project area'.

The Armow Wind Project area is dominated by agricultural fields, including rotational corn, wheat and soy crops, hayfields and pastureland. Habitats within the project area are expected to include woodlands, wetlands, meadows, thickets, drainage ditches, ponds, creeks and hedgerows. Large forests and wetlands exist within the Municipality of Kincardine, some of which are present in and within 120m of the project location. Within the municipality, there are also many species of conservation concern and natural areas; however, many of these records are found within the Lake Huron shoreline and are likely outside of the project area (Dougan & Associates and North-South Environmental Inc. 2009). The Armow Wind Project area, as well as natural features, are provided on Figure 1.

As part of this Project, NRSI has considered all aspects relating to provincially Threatened and Endangered species; however, since these species are addressed as part of the *Endangered Species Act* (2007), they have not been discussed within any of the Natural Heritage reports, which include the Records Review, Site Investigation, Evaluation of Significance and the Environmental Impact Study reports. Provincially Threatened and Endangered species will be addressed in full detail as part of a separate *Approval and Permitting Requirements Document (APRD)* to be submitted to the Ontario Ministry of Natural Resources (OMNR) under a separate cover, where necessary. This APRD will include a description and results of field assessments, potential impacts, and recommended mitigation measures relating to provincially Threatened and Endangered species.

Figure 1

Armow Wind Project

Project Area and Natural Features

Legend

- Project Area (120m)
- Proposed Turbine (L12 Rev1)
- MET Tower
- Junction Box
- Crane Walk
- Cabling
- Access Road
- Disturbance Area
- Potential Operations Building
- Substation
- Staging Area
- Interconnect Area
- Highway
- Primary Road
- Secondary Road
- Watercourse (Permanent)
- Watercourse (Intermittent)
- Waterbody
- ANSI, Life Science
- Deer Wintering Area
- Provincially Significant Wetland
- Non-Provincially Significant Wetland
- Wooded Area

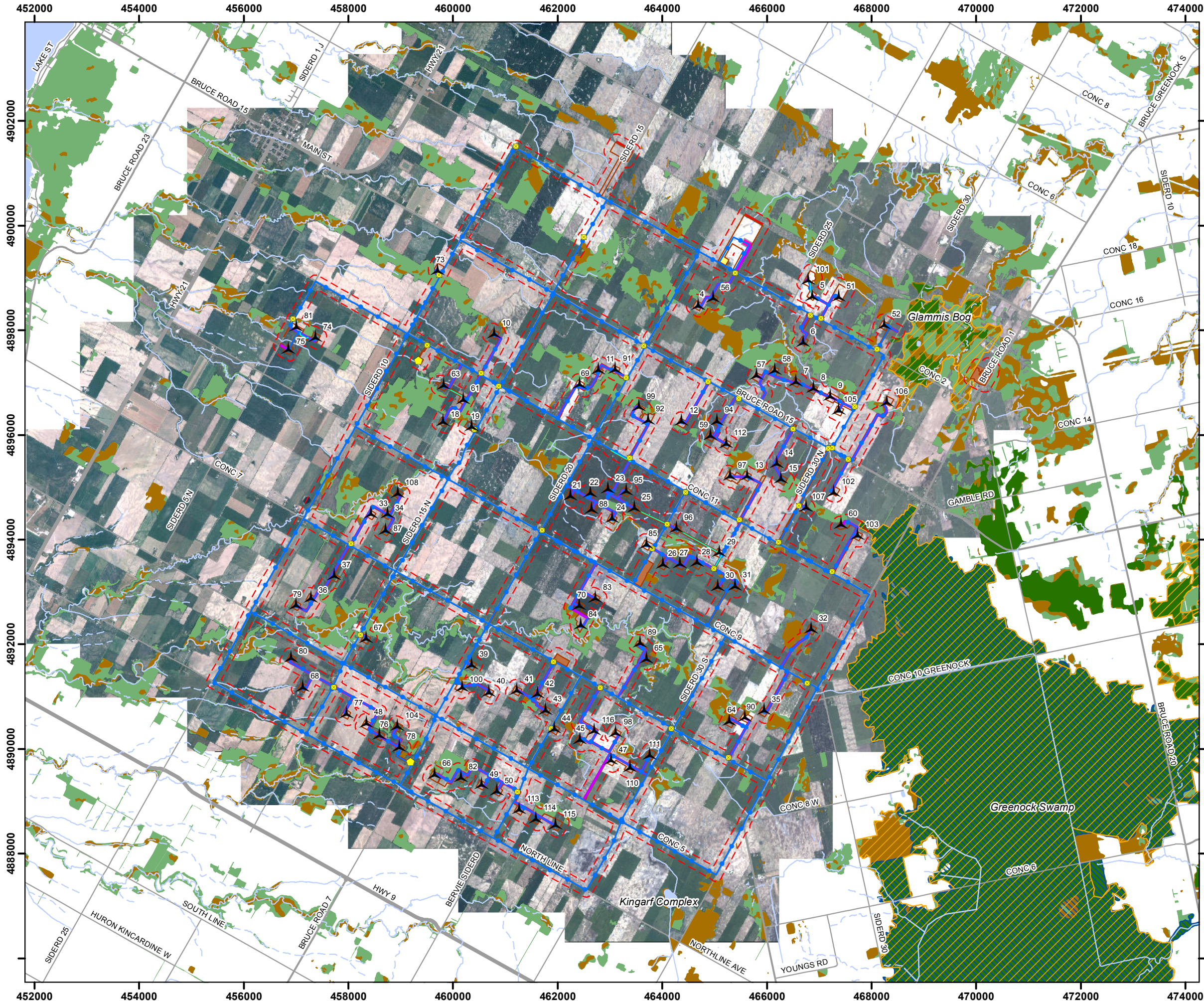
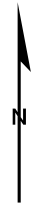
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Data provided by MNR© Copyright: Queen's Printer Ontario.
Imagery provided by Golder Associates, 2011.

Project: 1275
Date: July-24-12

NAD83 - UTM Zone 17
Size: 11x17"
1:72,000

0 1 2 3 4 5 kms



2.0 REA Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act* identifies the requirements for the development of renewable energy projects in Ontario. This records review report was prepared in accordance with Section 25 of O. Reg. 359/09 with guidance provided from the *Natural Heritage Assessment Guide for Renewable Energy Projects* (OMNR 2011a). The intent of this section is to identify, verify and document any natural features present at or within 120m of the proposed project location.

Section 25 of the REA Regulation requires proponents of Class 4 wind projects to undertake a natural heritage records review to identify whether the project location is:

1. in a provincial park or conservation reserve
2. within 120m of a provincial park or conservation reserve
3. in a natural feature
4. within 50m of an area of natural and scientific interest (earth science), or
5. within 120m of a natural feature that is not an area of natural and scientific interest (earth science)

Natural Features are defined in Section 1.1 of the REA Regulation to be all or part of

- (a) an area of natural and scientific interest (ANSI) (earth science)
- (b) an ANSI (life science)
- (c) a coastal wetland
- (d) a northern wetland
- (e) a southern wetland
- (f) a valleyland
- (g) a wildlife habitat, or
- (h) a woodland.

Subsection 3 of Section 25 of the REA Regulation requires the proponent to prepare a report “setting out a summary of the records searched and the results of the analysis” (O. Reg. 359/09). This Natural Heritage Records Review Report has been prepared to meet these requirements.

3.0 Records Review Methodology

In accordance with the REA Regulation, NRSI biologists consulted several information sources and agencies for the purposes of assessing natural features and wildlife habitat within 120m of the project location. The results of this consultation process have been documented throughout the following report, and have been summarized in Table 1 below.

Table 1. Summary of Records Consulted for the Armow Wind Project.

Information Source	Consultation Date(s)	Type of Records Obtained
Ministry of Natural Resources, Renewable Energy Operations Team (REOT) (OMNR 2011b)	October 24, 2011	Provincial Parks Conservation Reserves Areas of Natural and Scientific Interest (LS) Areas of Natural and Scientific Interest (ES) Woodlands Wetlands Significant Wildlife Habitat
Environment Canada / Canadian Wildlife Service (Rob Read)	November 25, 2011	No records received as of the date of this report
County of Bruce Official Plan (County of Bruce 2010)	September 28, 2011	Areas of Natural Scientific Interest Wetlands Provincially Significant Wetlands
Saugeen Valley Conservation Authority (Kalena Metcalfe)	November 17, 2011	No records received as of the date of this report
Natural Heritage Study for the Municipality of Kincardine (Dougan & Associates and North-South Environmental Inc. 2009)	October 3, 2011	Areas of Natural and Scientific Interest Provincially Significant Wetlands Significant Wildlife Habitat
Ministry of Natural Resources, NHIC and Biodiversity Explorer (OMNR 2010a)	October 3, 2011	Areas of Natural and Scientific Interest (Life Science) Areas of Natural and Scientific Interest (Earth Science) Wetlands Significant Wildlife Habitat
Ministry of Natural Resources, Land Information Ontario	November 24, 2011	Areas of Natural and Scientific Interest (LS) Areas of Natural and Scientific Interest (ES) Woodlands Wetlands Significant Wildlife Habitat
Ministry of Northern Development, Mines, and Forestry (Ontario Ministry of Northern Development and Mines 2011)	November 23, 2011	Significant Wildlife Habitat
Ontario Herpetofaunal Atlas (Oldham and Weller 2000)	October 3, 2011	Significant Wildlife Habitat
Atlas of the Mammals of Ontario (Dobbyn 1994)	October 3, 2011	Significant Wildlife Habitat
Ontario Breeding Bird Atlas (Cadman et al. 2007)	August 30, 2011	Significant Wildlife Habitat

Information Source	Consultation Date(s)	Type of Records Obtained
Christmas Bird Count (National Audubon Society 2011)	October 3, 2011	Significant Wildlife Habitat
Bird Studies Canada, Important Bird Areas (Bird Studies Canada 2004)	September 28, 2011	Significant Wildlife Habitat
Bird Studies Canada (Jon McCracken)	November 21, 2011	Significant Wildlife Habitat
Spring Migration, Breeding and Overwinter Monitoring, 2008 – Armow, Ontario (Jacques Whitford Ltd. 2009a)	November 24, 2011	Significant Wildlife Habitat
Fall Avian Monitoring, 2008 – Armow, Ontario (Jacques Whitford Ltd. 2009b)	November 24, 2011	Significant Wildlife Habitat
Spring Migration Monitoring Program – Armow Wind Project (Golder Associates Ltd. 2009a)	November 24, 2011	Significant Wildlife Habitat
Fall Migration Bat Monitoring Program – Armow Wind Project (Golder Associates Ltd. 2009b)	November 24, 2011	Significant Wildlife Habitat

4.0 Natural Areas

For the purposes of the Natural Heritage Assessment reporting, NRSI has used the term '*natural area*' to identify features that have already been given a provincial or federal designation, including provincial parks, conservation reserves, and Areas of Natural and Scientific Interest (ANSI). Information obtained on each of these natural areas is provided below.

4.1 Provincial Parks and Conservation Reserves

There are no Provincial Parks or Conservation Reserves within 120m of the Armow Wind Project location.

4.2 Areas of Natural and Scientific Interest (ANSIs) – Life Science

Two provincially significant Life Science (LS) ANSIs exist within 120m of the project location and are described below.

Greenock Swamp ANSI

The provincially significant Greenock Swamp ANSI is primarily situated east of the Municipality of Kincardine. The most northwestern point of this ANSI is located within 120m of the Armow Wind Project location, but does not overlap with the project location. The Greenock Swamp ANSI is a deciduous swamp which is dominated by silver maple (*Acer saccharinum*) and red maple (*Acer rubrum*), and green/red ash (*Fraxinus pennsylvanica*) to lesser extent. Mixed swamp also occurs within the Greenock Swamp ANSI, dominated by eastern white cedar (*Thuja occidentalis*) and red maple (OMNR 2010a). The Greenock Swamp ANSI also provides a good representation of fen and bog communities, comprising one of the largest and diverse swamp forests and wetlands in southwestern Ontario (Dougan & Associates and North-South Environmental Inc. 2009). As one of the largest continuous stretches of forest and swamp, the Greenock Swamp ANSI provides migratory and nesting habitat for waterfowl and contains an active deer yard (OMNR 2010a).

Glamis Bog LS ANSI

The provincially significant Glamis Bog LS ANSI is found in and within 120m of the Armow Wind Project location, and is comprised of 5 individual wetlands and the

following three wetland types: bog, swamp and marsh. The Glammis Bog LS ANSI primarily consists of moraines, specifically kame moraines, which are largely covered by deciduous forests dominated by sugar maple (*Acer saccharum*) (OMNR 2010a). Depressions found in the Glammis Bog ANSI encompass significant acid bog and swamp communities (Dougan & Associates and North-South Environmental Inc. 2009). Bog communities within the ANSI are largely dominated by heath and sedge species, while the swamp communities are dominated by white cedar, red maple, yellow birch (*Betula alleghaniensis*) and tamarack (*Larix laricina*) (OMNR 2010a).

4.3 Areas of Natural and Scientific Interest – Earth Science

There are no Earth Science ANSIs within 50m of the Armow Wind Project location.

4.4 Other

There are no other known significant areas located within 120m of the Armow Wind Project location.

5.0 Woodlands

According to the information collected from the sources identified above (Table 1), the Armow Wind Project location overlaps with 32 woodlands, and a total of 153 woodlands have been identified as occurring within 120m of the project location. Most of these woodlands are expected to be dominated by mid-aged to mature deciduous tree species; however, young woodlands, treed plantations, or occasional coniferous woodlands may also be present. Available basemapping indicates that 151 woodlands found within 120m of the project location range in size from 0.13 ha to 120.53 ha. In addition to these woodlands, as indicated earlier, the Glamis Bog ANSI and Greenock Swamp are found within 120m of the project location. These larger deciduous woodlands are approximately 149ha and 5,730ha in size, respectively.

A majority of the identified woodlands within 120m of the project location are expected to be deciduous forests, composed of species that are characteristic of the region (Ecodistrict 6E). Several other woodland types, such as mixed forests or coniferous plantations may also be present. These woodlands are scattered throughout the project area and are located in and within 120m of several project locations, including turbines, access roads and cabling (see Figure 1). Species associations and distances of these woodlands to project locations will be confirmed during the site investigation phase of this project.

6.0 Wetlands

The Armow Wind Project location overlaps with 8 wetlands according to the information collected from the sources identified above, and a total of 89 wetlands have been identified as occurring within 120m of the project location. Of these 89 wetlands, only 3 wetlands have been evaluated, including 2 Provincially Significant Wetlands (PSWs).

The Greenock Swamp Provincially Significant Wetland (PSW) is located south of Bruce Road 15, at Bruce Road 1, and extends south to Concession Road 8 in the Municipality of South Bruce. This PSW is approximately 8,948ha in size, and is comprised of 41 individual wetlands and the following four wetland types: bog, fen, swamp and marsh (OMNR 2010a). Species associations and distances of these wetlands to project locations should be confirmed during the site investigation phase of this project.

The Glammis Bog PSW is located south of Bruce Road 20, north of Bruce Road 15, east of Sideroad 30 and west of Bruce Road 1. This PSW is approximately 79ha in size, and is comprised of 5 individual wetlands and the following three wetland types: bog, swamp and marsh (OMNR 2010a).

The presence/absence of all identified wetlands, wetland boundary delineation, as well as distances to project locations, will all be confirmed during the site investigation.

7.0 Valleylands

Information pertaining to valleylands is generally maintained by the local Conservation Authorities. Records pertaining to valleylands have been requested but have not been received from the Saugeen Valley Conservation Authority as of the date of this report. Valleylands have not been mapped as part of the Bruce County Official Plan (County of Bruce 2010) or within the Natural Heritage Study for the Municipality of Kincardine (Dougan & Associates and North-South Environmental Inc. 2009). Background information from the OMNR indicated that valleylands are unknown from the project area (OMNR 2011b). A more detailed review of potential valleylands will occur as part of the site investigation phase of this project.

8.0 Wildlife Habitat

As part of the REA process, NRSI biologists have examined available records associated with the presence of wildlife habitat within 120m of the Armow Wind Project location. For the purposes of this series of the Natural Heritage Assessment reports, NRSI has separated the discussion on wildlife habitat into four broad categories, following the Significant Wildlife Habitat Technical Guide (OMNR 2000). These four categories are seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of species of conservation concern, and animal movement corridors. Each of these broad wildlife habitat categories are described in the following sections.

8.1 Seasonal Concentration Areas

The records review process indicated a total of 3 known seasonal concentration areas within 120m of the Armow Wind Project location, as summarized in Table 2. The presence of potential seasonal concentration areas within 120m of the project location will be confirmed during the site investigation phase of the project.

In addition to the known seasonal concentration areas, background information has indicated that several concentration areas have the potential to be present within the Armow Wind Project area. Each of these habitats are discussed in Table 2 below, including information on whether further consideration is required during the site investigation phase of this project.

Table 2. Summary of Seasonal Concentration Areas Identified Near the Armow Wind Project Area

Seasonal Concentration Areas	Present in or Within 120m of Project Location	Details	Site Investigation Required (Y/N)
Waterfowl Stopover and Staging Areas (Terrestrial)	Unknown	A site investigation will be conducted.	Yes
Waterfowl Stopover and Staging Areas (Aquatic)	Unknown	There are 89 wetlands and several watercourses present throughout the project area. A site investigation will be conducted.	Yes

Seasonal Concentration Areas	Present in or Within 120m of Project Location	Details	Site Investigation Required (Y/N)
Shorebird Migratory Stopover Areas	Yes	Migratory passerine and/or shorebird stopover area indicated as “high significance” in the Greenock Swamp wetland evaluation. A site investigation will be conducted.	Yes
Raptor Winter Feeding and Roosting Areas	Unknown	It is expected that a combination of forest and upland habitats >20ha are present within the project area. In addition, winter raptor indicator species have been made (Jacques Whitford Limited 2009a). A site investigation will be conducted.	Yes
Bat Hibernacula	Unknown	Ministry of Northern Development, Mines and Forestry was consulted. There are no abandoned mines but there are inferred and potential karsts within 120m of the project location. A site investigation will be conducted.	Yes
Bat Maternity Colonies	Unknown	There are 153 woodlands within 120m of the project location that will be further examined during site investigation.	Yes
Bat Migratory Stopover Area	Unknown	The location and characteristics of stopover habitats are generally unknown. The confirmation criteria and habitat areas for this SWH are still being determined by the MNR.	No
Turtle-Over-wintering Habitat	Unknown	There are 89 wetlands located within the project area, and open water communities are expected. A site investigation will be conducted.	Yes
Reptile Hibernacula (snakes)	Unknown	Ministry of Northern Development, Mines and Forestry was consulted. Potential and inferred karsts are expected to be present within the project area. A site investigation will be conducted to confirm any reptile hibernacula.	Yes
Colonial-Nesting Bird Breeding Habitat (bank and cliff swallows)	Unknown	Habitat for bank and cliff swallows, such as eroding	Yes

Seasonal Concentration Areas	Present in or Within 120m of Project Location	Details	Site Investigation Required (Y/N)
		banks, sandy hills, etc. may be present within the project area. A site investigation will be conducted.	
Colonial-Nesting Bird Breeding Habitat (tree/shrubs)	Yes	Nesting Great Blue Herons have been reported in Glamis Bog and Greenock Swamp. A site investigation will be conducted.	Yes
Colonial-Nesting Bird Breeding Habitat (ground)	Unknown	A site investigation will be conducted.	Yes
Migratory Butterfly Stopover Areas	Unknown	The project area is not within 5km of Lake Ontario.	No
Landbird Migratory Stopover Areas	N/A	The project area is not within 5km of Lake Ontario.	No
Winter Deer Yards	Yes	MNR identified a stratum 2 deer yard within Greenock PSW/ANSI. No site investigation is required for this feature.	No

8.2 Rare Vegetation Communities and Specialized Wildlife Habitat

The records review process indicated one known rare vegetation community and 3 known specialized wildlife habitats within 120m of the project location. The presence of these rare vegetation communities and specialized wildlife habitats will be confirmed during the site investigation phase of the Project.

Additional background information has also indicated that many of these natural features have the potential to be present. Each of these rare vegetation communities and specialized wildlife habitats is discussed in Table 3 below, including information on whether further consideration is required during the site investigation phase of this Project.

Table 3. Summary of Rare Vegetation Communities and Specialized Wildlife Habitat Identified Near the Armow Wind Project Area

Wildlife Habitat	Present Within 120m of Project Location	Details	Site Investigation Required (Y/N)
Cliffs and Talus Slopes	Unknown	Basemapping does not indicate the presence of this habitat.	Yes
Sand Barrens	Unknown	Basemapping does not indicate the presence of this habitat.	Yes
Alvars	Unknown	Basemapping does not indicate the presence of this habitat.	Yes
Old-growth or Mature Forest Stands	Yes	The Greenock Swamp is considered an old-growth/mature forest stand. In addition, there are 152 additional woodlands within the project area which may contain old-growth or mature forest stands. A site investigation will be conducted.	Yes
Savannahs	Unknown	Unknown	Yes
Tall-grass Prairies	Unknown	Unknown	Yes
Other Rare Vegetation Communities	Unknown	There are 153 woodlands and 89 wetlands within the project area that may contain rare vegetation communities. A site investigation will be conducted.	Yes
Waterfowl Nesting Habitat	Yes	Waterfowl production indicated as "local significance" in the Greenock Swamp and Glammis Bog wetland evaluations. A site investigation will be conducted.	Yes
Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	Unknown	Forested areas adjacent to riparian areas are expected in the project area, including one PSW. A site investigation will be conducted.	Yes
Woodland Raptor Nesting Habitat	Unknown	There are 20 woodlands located within the project area that are >30ha in size. These woodlands will be further examined during site investigation.	Yes
Turtle Nesting Habitat	Yes	Snapping turtles have been documented nesting in Greenock Swamp. There are also 89 wetlands in the project area that may also provide turtle nesting habitat. A site investigation will be conducted.	Yes
Seeps and Springs	Unknown	There are 153 woodlands within the project area that may be located within headwater	Yes

Wildlife Habitat	Present Within 120m of Project Location	Details	Site Investigation Required (Y/N)
		areas of a stream, potentially containing seeps/springs. A site investigation will be conducted.	
Amphibian Breeding Habitat (woodland)	Unknown	There are 153 woodlands within 120m of the project location that will be further examined for suitable habitat during site investigation.	Yes
Amphibian Breeding Habitat (wetland)	Yes	Bullfrog concentration areas were identified in the Glammis Bog and Greenock Swamp wetland evaluations. In addition, there are 89 wetlands located within the project area. A site investigation will be conducted.	Yes

8.3 Habitats of Species of Conservation Concern

Species of conservation concern include all species that have been designated as a species of Special Concern according to the Species at Risk in Ontario (SARO) or have been given a provincial S-Rank of S1-S3, but have not been designated as either Endangered or Threatened within Ontario. This also includes species that have been determined to be significant federally, but not identified as rare within the province of Ontario. Species at Risk (provincially Threatened or Endangered) will be addressed separately in an *Approval and Permitting Requirements Document* to address the *Endangered Species Act* (2007).

The records review process indicated one known habitat for species of conservation concern within 120m of the Armow Wind Project location, as summarized in Table 4. The presence of potential habitats for species of conservation concern within 120m of the project location will be confirmed during the site investigation phase of the project.

In addition to the known habitat for species of conservation concern, background information has indicated that many of these habitats have the potential to be present within the Armow Wind Project area. Each of these habitats are discussed in Table 4 below, including information on whether further consideration is required during the site investigation phase of this project.

Table 4. Summary of Habitats of Species of Conservation Concern Identified Near the Armow Wind Project Area

Wildlife Habitat	Present Within 120m of Project Location	Details	Site Investigation Required (Y/N)
Marsh Bird Breeding Habitat	Yes	Marsh birds were identified in the Glamis Bog wetland evaluation. In addition, the project area contains a total of 89 wetlands, including two PSWs, which may contain shallow water with emergent vegetation. A site investigation will be conducted.	Yes
Woodland Area Sensitive Breeding Birds	Unknown	A total of 20 woodlands have been identified as having interior habitat. A site investigation will be conducted.	Yes
Open Country Breeding Bird Habitat	Unknown	It is expected that the project area contains grassland areas, including open pastures and meadows. In addition, the Ontario Breeding Bird Atlas was consulted. A site investigation will be conducted.	Yes
Shrub/Early Successional Bird Breeding Habitat	Unknown	A site investigation will be conducted to confirm early successional thicket or shrub habitats within 120m of the project location.	Yes
Terrestrial Crayfish	Unknown	There are 89 wetlands within the project area which may contain crayfish chimneys. A site investigation will be conducted.	Yes
Special Concern and Rare Wildlife Species	Yes	These species are further discussed in subsequent sections of this report.	Yes

Through a query of the records consulted in this review (see Table 1), a total of 47 species of conservation concern have been identified within the vicinity of the Armow Wind Project area. These records include 9 historical sightings (prior to 1980) that are expected to represent historical populations that are unlikely to be present within 120m of the project location. The remaining 36 current (1980-2010) species records represent

a variety of species groups, including 15 vegetation species, 16 birds, 3 reptiles, and 2 insects. Each of these species is discussed in more detail in the following sections.

8.3.1 Vegetation

A total of 15 vegetation species of conservation concern have been documented within the vicinity of the project area. Each of these species, including provincial and federal status, has been identified in Table 5 below.

Table 5. Vegetation Species of Conservation Concern Identified Near the Armow Wind Project Area

Scientific Name	Common Name	S-Rank	SARO Status ³	COSEWIC Status ⁴
<i>Arnoglossum plantagineum</i>	Tuberous Indian-plantain ^{1,2}	S3	SC	SC
<i>Calamovilfa longifolia</i> var. <i>magna</i>	Great Lakes Sand Reed ¹	S3		
<i>Carex tetanica</i>	Common Stiff Sedge ²	S3		
<i>Cypripedium arietinum</i>	Ram's-head Lady's-slipper ¹	S3		
<i>Eleocharis rostellata</i>	Beaked Spike-rush ^{1,2}	S3		
<i>Elymus lanceolatus</i> ssp. <i>psammophilus</i>	Great Lakes Wild Rye ¹	S3		
<i>Gentianella quinquefolia</i>	Stiff Gentian ¹	S2		
<i>Hybanthus concolor</i>	Eastern Green-violet ^{1,2}	S2		
<i>Monarda didyma</i>	Oswego-tea ²	S3		
<i>Peltandra virginica</i>	Arrow-arum ²	S2		
<i>Platanthera flava</i>	Tubercled Orchid ²	S3		
<i>Platanthera macrophylla</i>	Large Round-leaved Orchid ^{1,2}	S2		
<i>Potamogeton hillii</i>	Hill's Pondweed ²	S2	SC	SC
<i>Scleria verticillata</i>	Low Nutrush ¹	S3		
<i>Sporobolus heterolepis</i>	Prairie Dropseed ¹	S3		

¹ Biodiversity Explorer (OMNR 2010a)

² District NHA Records Review for Renewable Energy Projects (OMNR 2011b)

³ SARO Status (OMNR 2010b)

⁴ COSEWIC Status (COSEWIC 2011a)

Provincial Rank (S-Rank)

S1: Critically Imperiled

S2: Imperiled

S3: Vulnerable

COSEWIC and SARO Status

END: Endangered

THR: Threatened

SC: Special Concern

Each of the 15 species of conservation concern is typical of natural habitats and is unlikely to occur within active agricultural fields. Habitat for species of conservation concern may be considered significant wildlife habitat, and as such, habitats for these species should be considered during the site investigation phase of this project. Due to the potential for habitats of these species to represent significant wildlife habitat, brief habitat descriptions for each species have been provided below.

Tuberous Indian-plantain

Tuberous indian-plantain (*Anoglossum plantagineum*) prefers open sunny areas in wet, calcareous meadows or shoreline fens, specifically along Lake Huron (White 2002). The tuberous Indian-plantain is listed as Special Concern and has been recorded within 120m of the project location (OMNR 2010a, OMNR 2011b). A site investigation will be conducted to confirm habitat or species presence within the project area.

Great Lakes Sand Reed

Great lakes sand reed (*Calamovilfa longifolia* var. *magna*) habitat consists of active sand dunes, open sand planes and forest openings on stabilize sand dunes (OMNR 2000). Although it is unlikely that suitable habitat for the great lakes sand reed is found within the project area, a site investigation will be conducted to confirm habitat and species presence.

Common Stiff Sedge

Common stiff sedge (*Carex tetanica*) habitat is comprised of moist grasslands, sandy shores, ditches, prairies and seepages (OMNR 2000). This sedge has been documented within 120m of the project location (OMNR 2011b). A site investigation will be conducted to confirm habitat and species presence within the project area.

Ram's-head Lady's-slipper

Ram's-head lady's-slipper (*Cypripedium arietinum*) grows in cedar woodlands on limestone plains, in wooded fens and on sandy sites (OMNR 2000). A site investigation will be conducted to confirm habitat and species presence within the project area.

Beaked Spike-rush

Beaked spike-rush (*Eleocharis rostellata*) grows in fens and shores (OMNR 2000). This species has been recorded within 120m of the project location. A site investigation will be conducted to confirm habitat and species presence within the project area.

Great Lakes Wild Rye

Great lakes wild rye (*Elymus lanceolatus* ssp. *psammophilus*) grows on Great Lakes sand dunes (OMNR 2000). Although it is unlikely that this species is found within the project area, a site investigation will be conducted to confirm habitat and species presence.

Stiff Gentian

Stiff gentian (*Gentianella quinquefolia*) can be found in moist soil, roadsides, streambanks, edges of woods and prairie habitats (OMNR 2000). It is expected that some of these habitats are present within the project area. A site investigation will be conducted to confirm habitat and species presence within the project area.

Eastern Green-violet

Eastern green-violet (*Hybanthus concolor*) grows in rich, wet-mesic floodplain forests and mesic forests over limestone (OMNR 2000). It is possible that these habitats are found within the project area. A site investigation will be conducted to confirm habitat and species presence within the project area.

Oswego-tea

Oswego-tea (*Monarda didyma*) can be found in moist woods, swampy thickets and roadsides (OMNR 2000). This species has been recorded within 120m of the project location (OMNR 2011b). A site investigation will be conducted to confirm habitat and species presence within the project area.

Arrow-arum

The arrow-arum (*Peltandra virginica*) is an aquatic plant that can be found in shallow waters in streams, rivers and marshes (OMNR 2000). The arrow-arum has been documented within 120m of the project location (OMNR 2011b). A site investigation will be conducted to confirm habitat and species presence within the project area.

Tuberclad Orchid

The tuberclad orchid (*Platanthera flava*) grows in wet, sandy or peaty open sites (OMNR 2000). Habitat for this species is likely to occur within the project area. A site investigation will be conducted to confirm habitat and species presence within the project area.

Large Round-leaved Orchid

Large round-leaved orchid can be found in moist, mixed woods (OMNR 2000). This species has been confirmed in the Glammis Bog area and therefore, may be present within the project area in similar habitats (OMNR 2011b). A site investigation will be conducted to confirm habitat and species presence within the project area.

Hill's Pondweed

Hill's pondweed (*Potamogeton hillii*) is an aquatic species that is found in highly alkaline waters of ditches, beaver ponds and slow moving, cold waters (OMNR 2000). This species is listed as Special Concern and has been noted within 120m of the project location. A site investigation will be conducted to confirm habitat and species presence within the project area.

Low Nutrush

Low nutrush (*Scleria verticillata*) occurs in moist-sandy meadows and shores (OMNR 2000). It is expected that meadows are found within the project area. A

site investigation will be conducted to confirm habitat and species presence within the project area.

Prairie Dropseed

Prairie dropseed (*Sporobolus heterolepis*) prefers moist to dry limestone plains and calcareous shores (OMNR 2000). Although it is unlikely that this species will be present in the project area, a site investigation will be conducted to confirm habitat and species presence within the project area.

By investigating the qualities and composition of suitable habitat for these species of conservation concern, NRSI biologists have determined that several of these species have the potential to be present within the Armow Wind Project area. The occurrence of these species will be further examined in the site investigation phase of the project.

8.3.2 Birds

NRSI has identified a total of 16 bird species of conservation concern that have the potential to occur within the vicinity of the Armow Wind Project area. Each of these 16 species is identified in Table 6 below.

Table 6. Bird Species of Conservation Concern Identified Near the Armow Wind Project Area

Scientific Name	Common Name	S-Rank	SARO Status ⁶	COSEWIC Status ⁷
<i>Asio flammeus</i>	Short-eared Owl ¹	S2N, S4B	SC	SC
<i>Aythya americana</i>	Redhead ^{2,3}	S2B, S4N		
<i>Aythya valisneria</i>	Canvasback ^{1,3}	S1B, S4N		
<i>Buteo lagopus</i>	Rough-legged Hawk ^{4,5}	S1B, S4N	NAR	NAR
<i>Calidris pusilla</i>	Semipalmated Sandpiper ⁵	S3B, S4N		
<i>Chlidonias niger</i>	Black Tern ^{1,3}	S3B	NAR	SC
<i>Clangula hyemalis</i>	Long-tailed Duck ²	S3B		
<i>Contopus cooperi</i>	Olive-sided Flycatcher ¹	S4B	SC	THR
<i>Chordeiles minor</i>	Common Nighthawk ³	S4B	SC	THR
<i>Euphagus carolinus</i>	Rusty Blackbird ^{4,5}	S4B	NAR	SC
<i>Haliaeetus leucocephalus</i>	Bald Eagle ^{2,4,5}	S2N, S4B		
<i>Larus marinus</i>	Great Black-backed Gull ²	S2B		
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker ³	S4B	SC	THR
<i>Pluvialis dominica</i>	American Golden-Plover ⁵	S2S3B, S4N		
<i>Wilsonia canadensis</i>	Canada Warbler ¹	S4B	SC	THR
<i>Vermivora chrysoptera</i>	Golden-winged Warbler ³	S4B	SC	THR

¹ Ontario Breeding Bird Atlas (Cadman et. al 2007)

² Christmas Bird Count (National Audubon Society 2011)

- ³ District NHA Records Review for Renewable Energy Projects (OMNR 2011b)
⁴ Spring Migration, Breeding and Overwinter Monitoring, 2008 Armow, Ontario (Jacques Whitford 2009a)
⁵ Fall Avian Monitoring, 2008 Armow, Ontario (Jacques Whitford 2009b)
⁶ SARO Status (OMNR 2010b)
⁷ COSEWIC Status (COSEWIC 2011a)

Provincial Rank (S-Rank)	COSEWIC and SARO Status
S1: Critically Imperiled	END: Endangered
S2: Imperiled	THR: Threatened
S3: Vulnerable	SC: Special Concern
S4: Apparently Secure	NAR: Not at Risk
SH: Historic	

Habitats for these species may be considered significant wildlife habitat, and will be reviewed in more detail during the site investigation and evaluation of significance phases of this project. Due to the potential for habitats of these species to represent significant wildlife habitat, brief habitat descriptions for each species have been provided below.

Short-eared owl

Short-eared owl (*Asio flammeus*) habitat consists of grasslands, open areas or meadows that are grassy or bushy. This species is a ground nester and requires 75-100ha of contiguous open habitat (OMNR 2000). The short-eared owl population has declined largely due to the destruction of wetlands by drainage for agriculture (OMNR 2000). It is possible that large areas of meadows, pastures, and hayfields may be present within the project area, and therefore support habitat for this species. A site investigation will be conducted to confirm short-eared owl habitat within the project area.

Redhead

Redhead (*Aythya americana*) habitat consists of cattail or bulrush marshes, fens, lakes, and ponds. Nesting is generally within 2m of the water's edge, though they can be found nesting considerably further than this (OMNR 2000). As there are 89 wetlands located within the project area, including two PSWs, a site investigation will be conducted to confirm redhead habitat within the project area.

Canvasback

The canvasback (*Aythya valisneria*) prefers deep permanent bodies of water for feeding and courtship and often uses large marshes for breeding (OMNR 2000). As there are large wetlands within 120m of the project location, a site investigation will be conducted to confirm habitat and presence of the species.

Rough-legged Hawk

Rough-legged hawk (*Buteo lagopus*) habitat is characterized by tundra, farmland, marshes and other expansive open habitats, and nests on cliff ledges in tundra (Sibley 2003). Although nesting habitat is not provided for this species, the project area contains farmland, open habitats and is expected to contain some marshes which may provide overwintering habitat for this species. A site investigation will be conducted to confirm habitat for this species within 120m of the project location.

Semipalmated Sandpiper

Semipalmated sandpiper (*Calidris pusilla*) habitat consists of beaches, mudflats, shallow estuaries and inlets during migration and winter, and breeding habitat consists of Arctic tundra, usually near water (Seattle Audubon Society 2011). Although this species was documented during the 2008 Fall Migration Monitoring (Jacques Whitford 2009b), it is expected that this species was using the project area during migration, and not for breeding. This species will not be carried forward to the site investigation.

Black Tern

The black tern (*Chlidonias niger*) prefers wetlands, and coastal or inland marshes. These marshes are often large cattail marshes or marshy edges of rivers, lakes or ponds. They can also be found using wet open fens and wet meadows (OMNR 2000). Often returning to the same location to nest, black terns require shallow (0.5 to 1m) waters in marshes greater than 20ha in size. As the black tern has been documented within the 120m of the project location (OMNR 2011b), a site investigation will be conducted to confirm habitat and bird presence.

Long-tailed Duck

The long-tailed duck (*Clangula hyemalis*) is commonly found on shallow ocean habitats with sandy bottoms and breeds on tundra ponds (Sibley 2003). This habitat does not exist within 120m of the project location. Although this species was documented in the Kincardine 2008 and 2010 Christmas Bird Counts, it is expected that this species was using the project area during migration, and not for breeding. This species will not be carried forward to the site investigation.

Olive-sided Flycatcher

Olive-sided flycatcher (*Contopus cooperi*) habitat is comprised of semi-open, conifer forests, often spruce dominated, near bodies of water including rivers, lakes and ponds. They can often be found nesting in treed wetlands with dead trees used for perching (OMNR 2000). As there are treed wetlands and 153 woodlands within the project area, a site investigation will be conducted in order to determine the presence of habitat for this species within 120m of the project location.

Common Nighthawk

Common nighthawk (*Chordeiles minor*) habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings (OMNR 2000). Although the species also nests in cultivated fields and orchards, they tend to occupy natural sites. It is expected that the project area contains open areas and fields that may provide suitable habitat for this species. A site investigation will be conducted in order to determine the presence of habitat for this species within 120m of the project location.

Rusty Blackbird

The rusty blackbird (*Euphagus carolinus*) prefers openings in coniferous woodlands bordering bodies of water and tree-bordered marshes, beaver ponds,

muskeg bogs, fens or wooded swamps (OMNR 2000). This species is not known to breed in southwestern Ontario. Although this species was observed within the vicinity of the project area (Jacques Whitford 2009a, Jacques Whitford 2009b), it is expected that the project area was used during migration and not for breeding. This species will not be carried forward to the site investigation.

Bald Eagle

Bald eagle (*Haliaeetus leucocephalus*) habitat tends to consist of large continuous areas of deciduous or mixed woods around large lakes or rivers and requires 255ha areas of open woodlands with tall trees for nesting, shelter, feeding as well as roosting (OMNR 2000). Due to the high proportion of agricultural fields and fragmentation of woodlands in the vicinity of the project location, it is not likely that breeding habitat is present within most of the Armow Wind Project area. The Greenock Swamp PSW, however, is 5,730ha in size, and maybe provide habitat for this species. A site investigation will be conducted.

Great Black-backed Gull

The great black-backed gull's (*Larus marinus*) habitat consists of rocky coastal islands, rocky beaches and cliffs. Although this species was documented in the Kincardine 2008 and 2010 Christmas Bird Count, it is expected that this species was most likely a vagrant, and was not using the project area as breeding habitat. This species will not be carried forward to the site investigation.

Red-headed Woodpecker

The red-headed woodpecker (*Melanerpes erythrocephalus*) prefers open, deciduous forests with little understory, fields or pasturelands with scattered large trees, wooded swamps, orchards, small woodlots or forest edges. This species also requires 4ha of territory as well as cavity trees with at least 40cm dbh (OMNR 2000). As the project area contains deciduous forests as well as fields and pasturelands, a site investigation will be conducted to confirm habitat for this species within 120m of the project location.

American Golden-Plover

The American golden-plover (*Pluvialis dominica*) prefers dry mudflats and shortgrass fields and pastures, and nests on relatively dry upland tundra (Sibley 2003). Although this species was documented during the 2008 Fall Migration Monitoring (Jacques Whitford 2009b), it is expected that this species was using the project area during migration, and not for breeding. This species will not be carried forward to the site investigation.

Canada Warbler

The Canada warbler (*Wilsonia canadensis*) is an interior forest species that prefers dense, mixed coniferous and deciduous forest with a closed canopy and wet bottomlands consisting of cedar or alder (OMNR 2000). They prefer locations with shrubby undergrowth in cool moist mature woodlands. The Canada warbler usually requires forested areas of at least 30ha in size (OMNR 2000). As the project area may contain mature woodlands with wet conditions, a site investigation will be conducted to determine the presence of the Canada warbler within the project area.

Golden-winged Warbler

Golden-winged warblers (*Vermivora chrysoptera*) require more than 10ha of habitat and prefer early successional habitat, as well as shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps (OMNR 2000). It is expected that the project area contains fields and woodlands. A site investigation will be conducted to confirm habitat for this species within 120m of the project location.

As a result of the review of species of conservation concern that may be present within the project area and preferred habitats of each species, NRSI biologists have determined that several of these species are expected to be present within 120m of the Armow Wind Project area based on available background information. Most of these species, if present, are most likely to be breeding within the nearby woodlands or hedgerow habitats, and are unlikely to use the active agricultural fields where the majority of the project location is proposed.

8.3.3 Herpetofauna

A total of 3 herpetofauna species of conservation concern, including 3 reptiles, have been documented within the vicinity of the project area. Each of these species, including provincial and federal status, has been identified in

Table 7 below.

Table 7. Herpetofauna Species of Conservation Concern Identified Near the Armow Wind Project Area

Scientific Name	Common Name	S-Rank	SARO Status ⁴	COSEWIC Status ⁵
<i>Chelydra serpentina serpentina</i>	Common Snapping Turtle ^{1,2}	S3	SC	SC
<i>Lampropeltis t. triangulum</i>	Eastern Milksnake ^{2,3}	S3	SC	SC
<i>Thamnophis sauritus septentrionalis</i>	Eastern Ribbonsnake (Great Lakes population) ^{2,3}	S3	SC	SC

¹ Ontario Herpetofauna Summary Atlas (Oldham and Weller 2000)

² District NHA Records Review for Renewable Energy Projects (OMNR 2011b)

³ Biodiversity Explorer Record (OMNR 2010a)

⁴ SARO Status (OMNR 2010b)

⁵ COSEWIC Status (COSEWIC 2011a)

Provincial Rank (S-Rank)

S1: Critically Imperiled

S2: Imperiled

S3: Vulnerable

COSEWIC and SARO Status

END: Endangered

THR: Threatened

SC: Special Concern

Habitats of these species is considered candidate significant wildlife habitat, and should be reviewed in more detail during the site investigation and evaluation of significance phases of this project. Due to the potential for habitats of these species to represent significant wildlife habitat, brief habitat descriptions for each species have been provided below.

Common Snapping Turtle

Common snapping turtles (*Chelydra serpentina serpentina*) can inhabit permanent, or semi-permanent, bodies of water, marshes, bogs, or rivers and streams with soft, muddy substrates (OMNR 2000). This species of Special Concern can often be found nesting considerable distances from aquatic habitats. It is possible that this species may be found within the watercourses in the project area, and may travel through the project area looking for breeding locations. A site investigation will be conducted to confirm habitat for this species.

Eastern Milksnake

Eastern milksnake (*Lampropeltis triangulum triangulum*) is a species of Special Concern and is also known to be a habitat generalist, often found in open woodlands, fields, and farm buildings (OMNR 2000). Habitat of this type is abundantly available in the project area, and there are several records of this species from within the project area. It is likely that the eastern milksnake is present within the Armow Wind Project area. A site investigation will be conducted to confirm habitat for this species.

Eastern Ribbonsnake (Great Lakes population)

Eastern ribbonsnakes (*Thamnophis sauritus*) are a species of Special Concern which live in open grassy areas with low, dense vegetation near bodies of shallow, permanent and calm water (OMNR 2000). Habitat of this type is available within the project area, and this species may occasionally be found along vegetated watercourses within the Armow Wind Project area. A site investigation will be conducted to confirm habitat for this species.

8.3.4 Mammals

A detailed records review has identified no mammal species of conservation concern that may occur within the vicinity of the Armow Wind Project. NRSI biologists will continue to examine potential habitats and document all mammal species encountered during the site investigation and evaluation of significance phases of this project.

8.3.5 Other Wildlife

A detailed records review has identified 2 insect species of conservation concern that may occur within the vicinity of the Armow Wind Project area. These 2 species, including provincial and federal status, has been identified in Table 8 below.

Table 8. Insect Species of Conservation Concern Identified Near the Armow Wind Project Area

Scientific Name	Common Name	S-Rank	SARO Status ³	COSEWIC Status ⁴
<i>Brychius hungerfordi</i>	Hungerford's Crawling Water Beetle ¹	S1		END
<i>Somatochlora tenebrosa</i>	Clamp-tipped Emerald ²	S2S3		

¹ District NHA Records Review for Renewable Energy Projects (OMNR 2011b)

² Biodiversity Explorer Record (OMNR 2010a)

³ SARO Status (OMNR 2010b)

⁴ COSEWIC Status (COSEWIC 2011a)

Provincial Rank (S-Rank)

S1: Critically Imperiled

S2: Imperiled

S3: Vulnerable

COSEWIC and SARO Status

END: Endangered

THR: Threatened

SC: Special Concern

Habitats of the species identified above are considered candidate significant wildlife habitat, and should be reviewed in more detail during the site investigation and evaluation of significance phases of this project. Due to the potential for habitats of these species to represent significant wildlife habitat, brief habitat descriptions for each species have been provided below.

Hungerford's Crawling Water Beetle

The distribution of the Hungerford's crawling water beetle is limited to only three rivers within Ontario, all within Bruce County, and includes the Rankin, the North Saugeen and the Saugeen Rivers. Habitat for this species includes medium-sized streams with moderate to fast flow, good stream aeration, cool (15°C-25°C) temperatures, inorganic substrate, and alkaline water conditions (COSEWIC 2011b). The project area contains several watercourses that may provide suitable habitat for this species. A site investigation will be conducted to confirm habitat for this species within 120m of the project location.

Clamp-tipped Emerald

The clamp-tipped emerald (*Somatochlora tenebrosa*), prefers shady forest streams up to 2m wide, that are often partly dry and occasionally boggy or swampy (Dunkle 2000). The project area contains several watercourses that may provide suitable habitat for this species. A site investigation will be conducted to confirm habitat for this species within 120m of the project location.

A site investigation will be completed to confirm the presence of the clamp-tipped emerald.

NRSI biologists will continue to examine potential habitats and document all wildlife species encountered during the site investigation and evaluation of significance phases of this project.

Table 9. Summary of Species of Conservation Concern with Habitat Present Within the Armow Wind Project Area

Scientific Name	Common Name	Details	Site Investigation Required (Y/N)
Vegetation			
<i>Arnoglossum plantagineum</i>	Tuberous Indian-plantain	Prefers open sunny areas in wet, calcareous meadows or shoreline fens, specifically along Lake Huron ¹	Yes
<i>Calamovilfa longifolia</i> var. <i>magna</i>	Great Lakes Sand Reed	Habitat consists of active sand dunes, open sand planes and forest openings on stabilize sand dunes ²	Yes
<i>Carex tetanica</i>	Common Stiff Sedge	Habitat is comprised of moist grasslands, sandy shores, ditches, prairies and seepages ²	Yes
<i>Cypripedium arietinum</i>	Ram's-head Lady's-slipper	Grows in cedar woodlands on limestone plains, in wooded fens and on sandy sites ²	Yes
<i>Eleocharis rostellata</i>	Beaked Spike-rush	Grows in fens and shores ²	Yes
<i>Elymus lanceolatus</i> ssp. <i>psammophilus</i>	Great Lakes Wild Rye	Found on Great Lakes sand dunes ²	Yes
<i>Gentianella quinquefolia</i>	Stiff Gentian	Grows in moist soil, roadsides, streambanks, edges of woods and prairie habitats ²	Yes
<i>Hybanthus concolor</i>	Eastern Green-violet	Habitat consists of rich, wet-mesic floodplain forests and mesic forests over limestone ²	Yes
<i>Monarda didyma</i>	Oswego-tea	Can be found in moist woods, swampy thickets and roadsides ²	Yes
<i>Peltandra virginica</i>	Arrow-arum	An aquatic plant found in shallow waters in streams, rivers and marshes ²	Yes
<i>Platanthera flava</i>	Tubercled Orchid	Grows in wet, sandy or peaty open sites ²	Yes
<i>Platanthera macrophylla</i>	Large Round-leaved Orchid	Can be found in moist, mixed woods ²	Yes
<i>Potamogeton hillii</i>	Hill's Pondweed	An aquatic species that is found in highly alkaline waters of ditches, beaver ponds and slow moving, cold waters ²	Yes
<i>Scleria verticillata</i>	Low Nutrush	Occurs in moist-sandy meadows and shores ²	Yes

Scientific Name	Common Name	Details	Site Investigation Required (Y/N)
<i>Sporobolus heterolepis</i>	Prairie Dropseed	Prefers moist to dry limestone plains and calcareous shores ²	Yes
Birds			
<i>Asio flammeus</i>	Short-eared Owl	Habitat consists of grasslands, open areas or meadows that are grassy or bushy ²	Yes
<i>Aythya americana</i>	Redhead	Requires shallow cattail/bulrush marshes, lakes ponds and fens ²	Yes
<i>Aythya valisneria</i>	Canvasback	Prefers large marshes for nesting and deep, permanent water-bodies for feeding and courtship ²	Yes
<i>Buteo lagopus</i>	Rough-legged Hawk	Habitat consists of tundra, farmland, marshes and other expansive open habitats, and nests on cliff ledges in tundra ³	Yes
<i>Calidris pusilla</i>	Semipalmated Sandpiper	Habitat consists of beaches, mudflats, shallow estuaries and inlets during migration and winter, and breeding habitat consists of Arctic tundra, usually near water ⁴	No
<i>Chlidonias niger</i>	Black Tern	Requires open water near nest sites and prefer marshes >20ha in size ²	Yes
<i>Clangula hyemalis</i>	Long-tailed Duck	Commonly found on shallow oceans with sandy bottoms and nests on tundra ponds ³	No
<i>Contopus cooperi</i>	Olive-sided Flycatcher	Habitat consists of semi-open, conifer forest, preferably spruce, near ponds, lakes or rivers ²	Yes
<i>Chordeiles minor</i>	Common Nighthawk	Habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings ²	Yes
<i>Euphagus carolinus</i>	Rusty Blackbird	Habitat consists of openings in coniferous woodlands bordering bodies of water and tree-bordered marshes, beaver ponds, muskeg bogs, fens or wooded swamps ²	No
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Habitat consists of large continuous areas of deciduous or mixed woods around large lakes or rivers ²	Yes
<i>Larus marinus</i>	Great Black-backed Gull	Habitat consists of flat rocky coastal islands, moorlands, rocky beaches, and cliffs ²	No
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Requires 4ha of open, deciduous forests with little understory, fields or pasturelands with scattered large trees, wooded swamps, orchards, small woodlots or forest edges, and	Yes

Scientific Name	Common Name	Details	Site Investigation Required (Y/N)
		cavity trees at least 40cm dbh ²	
<i>Pluvialis dominica</i>	American Golden-Plover	Prefers dry mudflats, shortgrass fields and pastures, and nests on relatively dry upland tundra ³	No
<i>Wilsonia canadensis</i>	Canada Warbler	Habitat consists of dense, mixed coniferous, deciduous forests with closed canopy, usually requires at least 30ha ²	Yes
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	Requires more than 10ha of habitat and prefers early successional habitat, as well as shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps ²	Yes
Herpetofauna			
<i>Chelydra serpentina serpentina</i>	Common Snapping Turtle	Inhabits permanent or semi-permanent bodies of water, marshes, bogs or rivers and streams with soft, muddy substrates ²	Yes
<i>Lampropeltis t. triangulum</i>	Eastern Milksnake	Habitat often consists of open woodlands, fields, and farm buildings ²	Yes
<i>Thamnophis sauritus septentrionalis</i>	Eastern Ribbonsnake (Great Lakes population)	Habitat consists of open grassy areas with low, dense vegetation near bodies of shallow, permanent and calm water ²	Yes
Insects			
<i>Brychius hungerfordi</i>	Hungerford's Crawling Water Beetle	Prefers medium-sized streams with moderate to fast flow, good stream aeration, cool (15°C-25°C) temperatures, inorganic substrate, and alkaline water conditions ⁵	Yes
<i>Somatochlora tenebrosa</i>	Clamp-tipped Emerald	Prefers shady forest streams up to 2m wide, that are often partly dry and occasionally boggy or swampy ⁶	Yes

¹ Update COSEWIC Status Report on the Tuberous Indian-Plantain (White 2002)

² Significant Wildlife Habitat Technical Guide (OMNR 2000)

³ The Sibley Field Guide to Birds of Eastern North America (Sibley 2003)

⁴ BirdWeb (Seattle Audubon Society 2011)

⁵ COSEWIC Assessment and Status Report on the Hungerford's Crawling Water Beetle (COSEWIC 2011b)

⁶ Dragonflies through Binoculars: A Field Guide to Dragonflies of North America (Dunkle 2000)

8.4 Animal Movement Corridors

Available basemapping indicated that there were several linear features, including treed fencerows and naturalized drains, within 120m of the project location. The suitability of

these features to be amphibian animal movement corridors will be confirmed during the site investigation phase of the project.

The MNR has identified a deer wintering area within 120m of the project location. A site investigation will be conducted to examine potential areas for deer movement corridors within the project area.

9.0 Summary of Records Review

In accordance with the REA Regulation, NRSI biologists have completed a comprehensive review of available background information pertaining to the Armow Wind Project area. This complete review has been provided in the preceding sections, and has been summarized in Tables 10-12 below.

The results of the records review of natural areas, including provincial parks, woodlands, and wetlands, are provided in Table 10 below. This table identifies which natural features need to be carried forward to the site investigation phase of the project based on information collected during this records review.

Table 10. Summary of Natural Feature Records Review

Natural Feature	Present In or Within 120m of Project Location	Present Within Project Location	Carried Forward to Site Investigation (Y/N)
Provincial Park	No	No	No
Conservation Reserve	No	No	No
Earth Science ANSI	No	No	No
Life Science ANSI	Yes	Yes	Yes
Wetland	Yes	Yes	Yes
Woodland	Yes	Yes	Yes
Valleyland	Unknown	Unknown	Yes

The results of the records review of wildlife habitat are provided in Table 11 below. This table summarizes the presence of the full range of potential wildlife habitats within the project area. The purpose of this table is to guide the site investigation to further refine what types of wildlife habitats are within the project area. Any wildlife habitats that have already been confirmed to be either not applicable to the project area or known to not occur within the project area will not be discussed in subsequent Natural Heritage Assessment reports for the Armow Wind Project.

Table 11. Summary of Wildlife Habitat Records Review for Armow Wind Project.

Wildlife Habitat	Present Within 120m of Project Location	Present Within Project Location	Carried Forward to Site Investigation (Y/N)
Waterfowl Stopover and Staging Areas (Terrestrial)	Unknown	Unknown	Yes
Waterfowl Stopover and Staging Areas (Aquatic)	Unknown	Unknown	Yes
Shorebird Migratory Stopover Areas	Yes	Unknown	Yes
Raptor Winter Feeding and Roosting Areas	Unknown	Unknown	Yes
Bat Hibernacula	Unknown	Unknown	Yes
Bat Maternity Colonies	Unknown	Unknown	Yes
Bat Migratory Stopover Area	Unknown	Unknown	No
Turtle-Over-wintering Habitat	Unknown	Unknown	Yes
Reptile Hibernacula (snakes)	Unknown	Unknown	Yes
Colonial-Nesting Bird Breeding Habitat (bank and cliff)	Unknown	Unknown	Yes
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	Yes	Unknown	Yes
Colonial-Nesting Bird Breeding Habitat (ground)	Unknown	Unknown	Yes
Migratory Butterfly Stopover Areas	Unknown	Unknown	No
Landbird Migratory Stopover Areas	N/A	N/A	No
Winter Deer Yards	Yes	No	Yes
Cliffs and Talus Slopes	Unknown	Unknown	Yes
Sand Barrens	Unknown	Unknown	Yes
Alvars	Unknown	Unknown	Yes
Old-growth or Mature Forest Stands	Yes	Unknown	Yes
Savannahs	Unknown	Unknown	Yes
Tall-grass Prairies	Unknown	Unknown	Yes
Other Rare Vegetation Communities	Unknown	Unknown	Yes
Waterfowl Nesting Habitat	Yes	Unknown	Yes
Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	Unknown	Unknown	Yes
Woodland Raptor Nesting Habitat	Unknown	Unknown	Yes
Turtle Nesting Habitat	Yes	Unknown	Yes
Seeps and Springs	Unknown	Unknown	Yes
Amphibian Breeding Habitat (woodland)	Unknown	Unknown	Yes
Amphibian Breeding Habitat (wetland)	Yes	Unknown	Yes
Marsh Bird Breeding Habitat	Yes	Unknown	Yes
Woodland Area Sensitive Breeding Birds	Unknown	Unknown	Yes
Open Country Breeding Bird Habitat	Unknown	Unknown	Yes
Shrub/Early Successional Bird Breeding Habitat	Unknown	Unknown	Yes
Terrestrial Crayfish	Unknown	Unknown	Yes
Special Concern and Rare Wildlife Species	Yes	Unknown	Yes
Amphibian Movement Corridors	Unknown	Unknown	Yes
Deer Movement Corridor	Unknown	Unknown	Yes

Following a full review of available records applicable to the Armow Wind Project, the following table has been prepared to outline the results of the records review as it specifically relates to the REA Regulation. Table 12 below outlines the presence of

natural areas and wildlife habitat that have the potential to overlap with, or occur within 120m of the project location.

Table 12. Summary of Natural Heritage Records Review for the Armow Wind Project Area.

Criteria	Result
1. Within 120m of a Provincial Park or Conservation Reserve	The Armow Wind Project location is not within 120m of a Provincial Park or Conservation Reserve.
2. In a Natural Feature	<p>The results of this records review indicate that project locations (i.e., disturbance area, cabling, access roads etc...) of the Armow Wind Project are located in and within 120m of natural features.</p> <p>A total of 32 woodlands overlap with the project location. These woodlands are expected to consist of deciduous forest with vegetation associations that are representative of this region of southwestern Ontario.</p> <p>A total of 8 wetlands overlap with the project location. These wetlands are expected to consist of deciduous swamp with vegetation associations that are representative of this region of southwestern Ontario. No PSWs overlap with the project location.</p> <p>The Glammis Bog Life Science ANSI also overlaps with the project location.</p> <p>The extent to which project locations overlap natural areas is variable and will be further examined and addressed in the site investigation phase of the project.</p>
3. Within 50m of a ANSI-ES	There are no ANSIs-ES located within 50m of the project location.
4. Within 120m of a Natural Feature	
a) ANSI-LS	There are two Provincially Significant Life Science ANSIs found within 120m of the project location: Greenock Swamp and Glammis Bog. The Glammis Bog Life Science ANSI also overlaps with the project location.
b) Coastal Wetland	No coastal wetlands are found within 120m of the project location.
c) Northern Wetland	No northern wetlands are found within 120m of the project location.
d) Southern Wetland	A total of 89 wetlands have been identified within 120m of the Armow Wind Project location, including two PSWs, Greenock Swamp and Glammis Bog. In addition, 8 of these wetlands overlap with the project location. The presence/absence of all wetlands, as well as distances to project locations, will be confirmed during the site investigation.
e) Valleyland	No valleylands have been identified within 120m of the project location.
f) Wildlife Habitat	A total of 39 wildlife habitats have been identified within 120m of the Armow Wind Project location. These wildlife habitats include seasonal concentration areas (3), rare vegetation communities and specialized wildlife habitats (4), habitats for species of conservation concern (1), as well as S1-S3, Special Concern and SH Species and Communities (31).

Criteria	Result
	<p>A total of 153 woodlands have been identified within 120m of the Armow Wind Project location, and 32 of these woodlands are located within the project location. These woodlands have the potential to provide several types of candidate Significant Wildlife Habitat (SWH).</p> <p>A total of 89 wetlands have been identified within 120m of the Armow Wind Project location, and 8 of these wetlands are located within the project location. These wetlands have the potential to provide several types of candidate Significant Wildlife Habitat (SWH).</p> <p>Several linear features, including treed fencerows and naturalized drains, have been identified within 120m of the project location. These features have the potential to act as SWH, specifically providing animal movement corridors and/or habitat for species of conservation concern.</p> <p>In addition, several other wildlife habitats, including seasonal concentration areas, rare vegetation communities and specialized wildlife habitats, and habitats for species of conservation concern, have the potential to be present within 120m of the project location.</p> <p>All of these wildlife habitats should be examined during the site investigation phase and/or the evaluation of significance phase of this project to identify other habitat features and identify the significance of each natural feature.</p>
g) Woodland	<p>A total of 153 woodlands have been identified during the records review process, each within 120m of the project location, with 32 of these woodlands located within the project location. Basemapping indicates that these woodlands range in size from 0.13 ha to 5,730 ha, which includes one large PSW, Greenock Swamp (5,730ha).</p> <p>These woodlands are expected to be primarily dominated by mid-aged to mature deciduous tree species; however, young woodlands, treed plantations, or occasional coniferous woodlands may also be present within 120m of the project location.</p>

10.0 References

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Appendix I
Ministry of Natural Resources Records Review

REOT

District NHA Records Review Template for Renewable Energy Projects

Armow Wind Project

Wind, Solar, Bioenergy

Ministry of Natural Resources

Renewable Energy Operation Team

October 24, 2011

NHA Records Review

Project Name:	Armow Wind Farm			
Project Location:	MNR District Midhurst	Municipality Kincardine (Kincardine and Bruce Townships)	Geo.Twp, Lot(s) & Con(s)	Various (bordered by concession 2 to the north, North Line to the south, Bruce Road 1 to the East and Highway 21 to the west)
Applicant:	Samsung Renewable Energy (contact B.Edwards) 55 Standish Court, 9 th Floor Mississauga, ON L5R 4B3		Phone #: 647-244-8160 Email: b.edwards@samsungrenewableenergy.ca	
Consultant:	Natural Resource Solutions Inc. (contact Andrew Ryckman) 225 Labrador Drive, Unit 1 Waterloo, ON N2K 4M8		Phone #: 519-725-2227 Email: aryckman@nrsi.on.ca	
Generation type:	<input checked="" type="checkbox"/> wind onshore	<input type="checkbox"/> wind offshore	<input type="checkbox"/> solar	<input type="checkbox"/> biomass/biogas
Nameplate Capacity:	200 MW			
Name of MNR Records Reviewer:	Whitney Moore Kathy Dodge			
Date Records Compiled:	November 2, 2011			
What Ecodistrict is the project located in?	6E-X			

Feature Type	Present within 120m of project location (yes, no, unknown, N/A)	Present within project location (yes, no, unknown, N/A)	MNR Comments (comments may expand on information provided and/or may include relevant records within the vicinity that were not within project location or 120m of project area)	Information Source (NHIC, district staff, etc. Include the data layer name where possible)
Provincial Park	NO	NO	Inverhuron PP ~ 6 km west of site.	NRVIS
Conservation Reserve	NO	NO		NRVIS
Earth Science ANSI*	NO	NO		NRVIS
Life Science ANSI	YES	YES	There are 2 Provincially Significant Life Science ANSIs within the project location- Greenoch Swamp, and Glammis Bog.	NRVIS
Wetland	YES	YES	Many pockets of unevaluated wetland throughout the area and project location. Glammis Bog and Greenoch Swamp PSW's located within project location.	NRVIS

Woodland			YES	YES	Many patches of woodland throughout the area and project location. The Greenock Swamp is the largest treed swamp in southern Ontario	NRVIS Area biologist
Valleyland			Unknown	Unknown		
Significant Wildlife Habitat	Habitats of Seasonal Concentrations of Animals	Winter deer yards	YES	YES	Stratum 2 deer yard within Greenock PSW/ ANSI	NRVIS
		Moose late winter habitat	N/A	N/A		
		Colonial-Nesting bird breeding habitat (bank and cliff swallows)	Unknown	Unknown		
		Colonial-Nesting bird breeding habitat (tree/shrub)	Yes		Nesting Great Blue Heron – Glammis Bog, Greenock Swamp	Glammis Bog Wetland Evaluation 1986: Greenock Swamp Wetland Evaluation 1989
		Colonial-Nesting bird breeding habitat (ground)	Unknown	Unknown		
		Waterfowl stopover and staging areas (terrestrial)	Unknown	Unknown		
		Waterfowl stopover and staging areas (aquatic)	Unknown	Unknown		
		Waterfowl nesting	yes		Waterfowl production indicated as “local significance” in wetland evaluations	Greenock Swamp Wetland Evaluation- 1989 Glammis Bog Wetland Evaluation 1986
		Shorebird migratory stopover areas	Unknown	Unknown		
		Landbird (songbird) migratory stopover areas	yes		Migratory Passerine and/or Shorebird Stopover Area indicated as “High Significance” in wetland evaluation	Greenock Swamp Wetland Evaluation- 1989
		Raptor winter feeding and roosting areas	Unknown	Unknown		
		Wild turkey winter range	Unknown	Unknown		
		Turkey vulture summer roosting areas	Unknown	Unknown		
		Reptile hibernacula (snakes)	Unknown	Unknown		
		Bat hibernacula	Unknown	Unknown		
		Bat maternity colonies	Unknown	Unknown		
		Bullfrog concentration Areas	Yes		Glammis Bog Wetland Evaluation 1986: Greenock Swamp Wetland Evaluation 1989	Glammis Bog Wetland Evaluation 1986: Greenock

						Swamp Wetland Evaluation 1989
		Amphibian breeding habitat (woodland)	Unknown	Unknown		
		Amphibian breeding habitat (wetland)	Unknown	Unknown		
		Migratory butterfly stopover areas	Unknown	Unknown		
	Rare Vegetation Communities or Specialized Habitats for Wildlife	Alvars	Unknown	Unknown		
		Tall-grass prairies	Unknown	Unknown		
		Savannahs	Unknown	Unknown		
		Rare forest types	Unknown	Unknown		
		Talus slopes	Unknown	Unknown		
		Rock barrens	Unknown	Unknown		
		Sand barrens	Unknown	Unknown		
		Great Lake dunes	Unknown	Unknown		
		Habitat for Area Sensitive Species	Unknown	Unknown		
		Forests providing high diversity of habitats	Unknown	Unknown		
		Old-growth or mature forest stands	yes		Greenock Swamp	
		Foraging areas with abundant mast	Unknown	Unknown		
		Amphibian woodland breeding ponds	Unknown	Unknown		
		Turtle nesting habitat	yes		Snapping turtles	Greenock Swamp Wetland Evaluation 1989
		Turtle over- wintering habitat	Unknown	Unknown		
		Woodland raptor nesting habitat	Unknown	Unknown		
		Osprey nesting, foraging and perching habitat	Unknown	Unknown		
		Moose calving areas	N/A	N/A		
		Moose aquatic feeding areas	N/A	N/A		
		Mineral licks	Unknown	Unknown		
		Mink, otter, marten, and fisher denning sites	Unknown	Unknown	Mink, otter were observed in the Greenock Swamp	Greenock Swamp Wetland Evaluation 1989
		Highly diverse areas	Unknown	Unknown		

[illegible]

☐ Unknown

* Earth Science ANSI only needs to be considered if it is located within 50m of the project location

APPENDIX A – Fictitious Records Review for a Renewable Energy Project

Feature Type	Present within 120m of project location <small>(yes, no, unknown, N/A)</small>	Present within project location <small>(yes, no, unknown, N/A)</small>	MNR Comments	Information Source
Provincial Park	No	No	Algonquin PP is 10km away Include this information in records review and do not carry forward to site investigation	NRVIS – PP/CR layer
Conservation Reserve	No	No	Decon Escarpment is 15km away Include this information in records review and do not carry forward to site investigation	NRVIS – PP/CR layer
Earth Science ANSI*	No	No	Rockfeller is 5km away Include this information in records review and do not carry forward to site investigation	NRVIS – ANSI layer
Life Science ANSI	No	No	Roseduck is 2km 7km away Include this information in records review and do not carry forward to site investigation	NRVIS – ANSI layer
Wetland	Yes	Yes	Woolie PSW within 120m. There is unevaluated wetlands within the project location that should be complexed with the existing PSW. See woodland comment. Include this information in records review and carry forward to site investigation	NRVIS – evaluated wetland layer and comment from District Ecologist
Woodland	Yes	Yes	Unevaluated woodlands present onsite and within 120m. Meet criteria for size and possibly other criteria that would deem this woodland as significant. Woodland in NE corner is likely swamp.	NRVIS – DRAPE imagery

					Include this information in records review and carry forward to site investigation	
Significant Wildlife Habitat	Habitats of Seasonal Concentrations of Animals	Winter deer yards	No	No	No suitable habitat onsite or within 120m Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Moose late winter habitat	No	No	No suitable habitat onsite or within 120m Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Colonial bird nesting sites	Yes	No	Heronry within 120m associated with Woolie PSW Include this information in records review and carry forward to site investigation	Comment from District Ecologist
		Waterfowl stopover and staging areas	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Waterfowl nesting	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Shorebird migratory stopover areas	Does not apply to project location		This project located 150km away from Great Lakes therefore does not apply Include this information in records review and carry forward to site investigation	SWHTG
		Landbird migratory stopover areas	Does not apply to project location		This project located 150km away from Great Lakes therefore does not apply Include this information in records review and carry forward to site investigation	SWHTG
		Raptor winter feeding and roosting areas	Yes	Unknown	Occurrence of Marsh Hawk reported in June 2010 within 120m feeding PSW edge Include this information in records review and carry forward to site investigation	District BioDatabase
		Wild turkey winter range	No	No	Dense conifer cover not present within 120m Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Turkey vulture summer roosting areas	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Reptile hibernacula	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Bat hibernacula	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Bullfrog concentration Areas	Unknown	Unknown	Bullfrogs are likely associated with PSW Include this information in records review and carry forward to site investigation	Comment from District Ecologist
		Migratory butterfly stopover	Does not apply to project		This project is not within 5km of Lake Ontario therefore	SWHTG

		areas	location		does not apply Include this information in records review and do not carry forward to site investigation	
	Rare Vegetation Communities or Specialized Habitats for Wildlife	Alvars	No	No	None onsite or within 120m Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Tall-grass prairies	No	No	Fields are active agricultural lands Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Savannahs	No	No	Fields are active agricultural lands Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Rare forest types	Unknown	Unknown	No records available – information lacking. Need to check the woodlands onsite and within 120m. Include this information in records review and carry forward to site investigation	Comment from District Ecologist
		Talus slopes	No	No	Change in elevation across entire site is <2m and is primarily agricultural land with PSW and some woodlands Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Rock barrens	No	No	None present in DRAPE Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Sand barrens	No	No	Deep clay soils in this area Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Great Lake dunes	Does not apply to project location		This project located 150km away from Great Lakes therefore does not apply Include this information in records review and do not carry forward to site investigation	SWHTG
		Habitat for Area Sensitive Species	Unknown	Unknown	Bird surveys necessary in woodland for interior species Include this information in records review and carry forward to site investigation	Comment from District Ecologist
		Forests providing high diversity of habitats	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Old-growth or mature forest stands	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Foraging areas with abundant mast	Does not apply to project location		Not within Bruce Peninsula therefore does not apply Include this information in records review and do not carry forward to site investigation	SWHTG

		Amphibian woodland breeding ponds	Unknown	Unknown	No records available – information lacking. Possible within woodland identified as potential swamp Include this information in records review and carry forward to site investigation	Comment from District Ecologist
		Turtle nesting habitat	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Specialized raptor nesting habitat	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Moose calving areas	No	No	Habitat not suitable Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Moose aquatic feeding areas	No	No	Habitat not suitable Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Mineral licks	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Mink, otter, marten, and fisher denning sites	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Highly diverse areas	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
		Cliffs	No	No	Change in elevation across entire site is <2m and is primarily agricultural land with PSW and some woodlands Include this information in records review and do not carry forward to site investigation	Comment from District Ecologist
		Seeps and springs	Unknown	Unknown	No records available – information lacking Include this information in records review and carry forward to site investigation	
	Animal Movement Corridors (list all that apply)	Woodland Edge	Yes	Yes	Woodland edge should be considered as travel corridor between woodland and PSW	Comment from District Ecologist
		Jackson Creek	Yes	Yes	Jackson Creek should be considered as a travel corridor between PSW and area identified as potential swamp	Comment from District Ecologist
	Species of Conservation Concern (list all that apply)	Snapping Turtle	Unknown	Unknown	Listed as special concern in Ontario and likely inhabits wetland and uses Jackson creek Include this information in records review and carry forward to site investigation	SAR Biologist comment
Valleyland			No	No	Change in elevation across entire site is <2m and no valleylands present in aerial imagery Include this information in	Comment from District Ecologist

			records review and do not carry forward to site investigation	
Is any portion of the project located within the Oak Ridges Moraine Plan Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes, are any of the following features known to be present on or within 120m of the project location?</i> <input type="checkbox"/> Sand Barrens <input type="checkbox"/> Savannagh <input type="checkbox"/> Tallgrass Prairie <input type="checkbox"/> Unknown				
Is the project location within the Protected Countryside (Greenbelt)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes, are any of the following features known to be present on or within 120m of the project location?</i> <input type="checkbox"/> Sand Barrens <input type="checkbox"/> Savannah <input type="checkbox"/> Tallgrass Prairie <input type="checkbox"/> Alvar <input type="checkbox"/> Unknown				

* Earth Science ANSI only needs to be considered if it is located within 50m of the project location

Appendix II
Biodiversity Explorer Query Results

Unique Identifier (Element ID)	EO ID	Scientific Name	English Name	G-rank	S-rank	Status of Endangered Wildlife in Canada (COSEWIC) Status	Species At Risk in Ontario (SARO) Status	Canada General Status	Ontario General Status	UTM Zone	Easting (nearest km)	Northing (nearest km)	First Observed Date	Last Observed Date
180770	91021	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	475000	4890000		8/1/1996
180770	91346	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	463000	4917000		1973-?
180770	91010	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	451000	4896000		6/7/1988
180770	91351	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	455000	4905000		5/27/1976
182542	90627	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	453000	4906000		5/15/1996
182542	90738	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	462000	4917000		8/10/1981
182542	90635	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	477000	4893000		5/28/1981
181176	41333	Somatochlora tenebrosa	Clamp-tipped Emerald	G5	S2S3					17	465000	4874000	8/24/1986	8/24/1986
168288	1917	Arnoglossum plantagineum	Tuberous Indian-plantain	G4G5	S3	SC	SC			17	470000	4918000	1884-07-25	7/13/1935
22164	92806	Calamovilfa longifolia var. magna	Great Lakes Sand Reed	G5T3T5	S3					17	452000	4904000	9/15/2004	9/15/2004
39024	22324	Cypripedium arietinum	Ram's-head Lady's-slipper	G3	S3					17	453000	4905000	1984-PRE	1984-PRE
39024	22321	Cypripedium arietinum	Ram's-head Lady's-slipper	G3	S3					17	448000	4905000	1984-PRE	1984-PRE?
23580	59373	Eleocharis rostellata	Beaked Spike-rush	G5	S3					17	473000	4873000		6/17/1976
22280	34981	Elymus lanceolatus ssp. psammophilus	Great Lakes Wild Rye	G5T3	S3					17	450000	4903000	7/16/1939	6/17/1989
143030	33013	Gentianella quinquefolia	Stiff Gentian	G5	S2					17	470000	4918000	9/13/1974	9/13/1974
115000	32029	Hybanthus concolor	Eastern Green-violet	G5	S2					17	465000	4879000	5/27/1987	7/14/1987
39112	5991	Platanthera macrophylla	Large Round-leaved Orchid	G4	S2					17	471000	4888000	7/14/1987	7/14/1987
23694	3121	Scleria verticillata	Low Nutrush	G5	S3					17	456000	4910000	9/5/1972	9/5/1972
22820	6137	Sporobolus heterolepis	Prairie Dropseed	G5	S3					17	454000	4907000	1984-PRE	7/4/1996