Ministry of
Natural Resources
Regional Resources Section
Southern Region
300 Water Street
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Peterborough, ON K9J 8M5

Ministère des
Richesses naturelles

Ontario

July 11, 2017

Romney Energy Centre Limited Partnership
53 Jarvis Street, Suite 300
Toronto, ON
M5C 2H2

RE: Natural Heritage Section of the EEMP for Romney Wind Energy Centre

Dear Mark Gallagher:

Ministry of Natural Resources and Forestry (MNRF) has reviewed the Natural Heritage section of the Environmental Effects Monitoring Plan (EEMP) for the Romney Wind Energy Centre located in the Town of Lakeshore in the Municipality of Chatham-Kent, the final version of which was submitted by Romney Energy Centre Limited Partnership on July 11, 2017.

This letter confirms that the EEMP was prepared in respect of birds and bats in accordance with MNRF's:

- *Bird and Bird Habitats: Guidelines for Wind Power Projects (2011),* and
- *Bat and Bat Habitats: Guidelines for Wind Power Projects (2011).*

Post-construction bird and bat mortality monitoring for the Romney Wind Energy Centre will be conducted at a minimum of 10 turbines, including T1, 2, 6, 8, 9, 10, 11, 13, 16 and 17. The post-construction monitoring requirements, as outlined in the NHA Confirmation letter issued July 11, 2017, will also be implemented.

MNRF expects the information contained in the natural heritage section of the EEMP to be considered in MOECC's Renewable Energy Approval decision, and if approved, be implemented by the applicant.

If you wish to discuss any part of this letter please contact Mike Poskin, A/Renewable Energy Coordinator, at 705-755-1362.

Sincerely,

Erin Cotnam
Land Use Planning Supervisor
Regional Operations Division
Ministry of Natural Resources and Forestry

cc. Mitch Wilson, District Manager, MNR Aylmer District
cc. Mike Poskin, A/Renewable Energy Coordinator, MNRF
cc. Amy Cameron, Regional Planning Ecologist, MNRF
cc. Kelly Belshaw, Regional Planner, MNRF
cc. Mohsen Keyvani, MOECC
cc. Nick Colella, MOECC
cc. Zeljko Romic, MOECC

Romney Wind Energy Centre
Bird and Bat Environmental Effects Monitoring Plan

Prepared for:
DNV-GL
Suite 100, 4100 Rue Molson
Montreal, Canada
H1Y 3N1

Project No. 1736C | July 2017

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Romney Wind Energy Centre
Bird and Bat Environmental Effects Monitoring Plan

Project Team:

Staff	Role
Andrew Ryckman	Project Advisor
Charlotte Teat	Project Manager/Biologist

Report submitted on July 11, 2017

Charlotte Teat

Charlotte Teat
Terrestrial & Wetland Biologist

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1.0 Purpose of the Environmental Effects Monitoring Plan

An Environmental Effects Monitoring Plan (EEMP) must be prepared to address negative environmental effects that may result from engaging in a renewable energy project. The EEMP must set out:

- Performance objectives in respect of the negative environmental effects,
- Mitigation measures to assist in achieving the performance objectives, and
- A program for monitoring negative environmental effects for the duration of the time that the project is engaged in, including a contingency plan to be implemented if any mitigation measures fail.

Furthermore, all Class 3 and 4 wind facilities must prepare an EEMP in respect of birds and bats in accordance with the following publications of the Ministry of Natural Resources and Forestry (MNRF):

- *Bats and Bat Habitats: Guidelines for Wind Power Projects* (OMNR 2011a)
- *Birds and Bird Habitats: Guidelines for Wind Power Projects* (OMNR 2011b)

This post-construction monitoring plan is one component of the EEMP submitted to the Ministry of the Environment and Climate Change (MOECC) as part of the Renewable Energy Approval (REA) Application for the Project. This document has been prepared in accordance with Ontario Regulation (O. Reg.) 359/09, MNRF's *Bats and Bat Habitats: Guidelines for Wind Power Projects* (July 2011) and MNRF's *Birds and Bird Habitats: Guidelines for Wind Power Projects* (December 2011).

2.0 Project Overview

Natural Resource Solutions Inc. (NRSI) was retained in April 2016 by DNV-GL, on behalf of Romney Energy Centre Limited Partnership (the "Proponent"), to conduct a Natural Heritage Assessment (NHA) in accordance with the Renewable Energy Approval (REA) Regulation, Ontario Regulation (O. Reg.) 359/09. This assessment includes a records review, site investigation, evaluation of significance, and environmental impact study of any potentially significant natural features or wildlife habitats at a proposed wind energy generating facility.

The Proponent is proposing to develop the Romney Wind Energy Centre (the "Project"). This Project, with a total nameplate capacity of up to 60 megawatts (MW), is considered to be a Class 4 wind facility. A total of 18 wind turbine locations are being permitted.

The Romney Wind Energy Centre is located in southwestern Ontario, Town of Lakeshore and the Municipality of Chatham Kent, Ontario. More specifically, the Project is located south of Highway 401, and extends along Richardson Side Road and Wheatley Road near the community of Wheatley, ON. The Project is located entirely within Ecoregion 7E (MNRF 2016).

Project components will be installed primarily on privately-owned agricultural lots within this area. It is anticipated that the electrical collector lines will be partially located within public road allowances. It is planned to connect to the existing Hydro One Networks Inc. (HONI) 230 kV transmission line located within the Town of Lakeshore, close to Richardson Side Road. A small section of transmission line (less than 1km) is proposed for the Project, to be built by HONI from the Point of Common Coupling (PCC) to the Point of Interconnect (POI).

According to O. Reg. 359/09, as amended, and as per the Natural Heritage Assessment Guide for Renewable Energy Projects (OMNR 2012), the Project Location is defined as "...*a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project*". As described therein, the Project Location boundary is the outer limit of where site preparation and construction activities

will occur (i.e., disturbance areas described below) and where permanent infrastructure will be located, including the air space occupied by turbine blades.

In accordance with the REA Regulation, NRSI has developed a monitoring program, which is outlined in this report, to assess the potential environmental impacts in respect of birds and bats that may result from engaging in the Project. This monitoring program has been developed as a supporting document to the Romney WEC NHA Environmental Impact Study (EIS; NRSI 2017).

3.0 Post-Construction Monitoring for Significant Wildlife Habitats

The Romney WEC NHA (NRSI 2017) received confirmation by the MNRF's Regional Operations Division on July 11, 2017 (refer to Appendix I). As part of this confirmation, several wildlife habitats have been treated as significant with a commitment for additional pre-construction surveys to be undertaken during the appropriate season prior to any construction activities, if site access to the habitat is granted. In addition to these significant wildlife habitats which may require post-construction monitoring, the REA Regulation requires that bird and bat post-construction mortality monitoring be conducted at all Class 4 wind facilities. Table 1 provides a summary of potential negative operational impacts to confirmed significant and treated as significant bird and bat habitats as per the Romney WEC NHA (NRSI 2017), with the exception of post-construction mortality monitoring, which is detailed separately in Section 4.0 of this report.

Table 1. Summary of Confirmed Significant or Treated as Significant Wildlife Habitats for the Project

Habitat Type	Feature ID	Potential Operational Impacts
Bat Maternity Colony	BMA-001* BMA-002* BMA-003*	• Species avoidance of habitat during operational phase. • Direct mortalities through collisions with operational turbines.
Colonially-Nesting Breeding Bird Habitat (Trees/Shrubs)	CBT-001* CBT-002* CBT-003*	• Species avoidance of habitat during operational phase. • Direct mortalities through collisions with operational turbines. • Spills (i.e. oil, gasoline, grease, and/or drilling frac-out, etc.) during the operational phase.
Landbird Migratory Stopover Area	LMS-001* LMS-002*	• Species avoidance of habitat during operational phase. • Direct mortalities through collisions with operational turbines.
Bird Species of Conservation Concern: Eastern Wood-Pewee Habitat Bald Eagle Habitat Wood Thrush Habitat	 EWP-001** (SCC-A) EWP-002* (SCC-B) EWP-003** (SCC-D) EWP-004** (SCC-G) EWP-005** (SCC-H) BAL-001 (SCC-F) BAL-002** WTH-001* (SCC-B)	• Species avoidance of habitat during operational phase. • Direct mortalities through collisions with operational turbines. • Spills (i.e. oil, gasoline, grease, and/or drilling frac-out, etc.) during the operational phase.

** These habitats have been treated as significant. The significance of these habitats could not be evaluated as site access was denied, and therefore no site-specific results could be collected.*

*** Only if these habitats are determined to be significant through pre-construction surveys described in the Romney WEC NHA Environmental Impact Study (EIS; NRSI 2017).*

The locations of wildlife habitats confirmed, or treated as, significant are shown on Maps 3-1 to 3-5. The potential negative environmental effects, performance objectives, mitigation strategy, environmental effects monitoring plan, and contingency measures are described in Table 2. The environmental effects monitoring plan for each wildlife habitat confirmed, or treated as, significant includes the post-construction survey methods, monitoring locations, frequency and duration of sample collection, technical and statistical value of the data, and reporting commitments.

Table 2. Summary ofd the Environmental Effects Monitoring Plan for Confirmed or Treated as Significant Wildlife Habitats for the Romney WEC

Feature ID	Infrastructure that Requires Individual Delineation of Feature[1]	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection[2]	Technical and Statistical Value of Data	Reporting Requirements[2]	
BMA-001* BMA-002* BMA-003* Bat Maternity Colony	Wind Turbine (<120m)	Species avoidance of habitat during operational phase. Direct mortality through collisions with operational turbines.	Protection of bat maternity colony habitat. Minimize the potential for mortality of bats through collisions with operational turbines.	Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs. Schedule regular (non-critical) Project maintenance activities within 30m of significant wildlife habitats during the critical roosting period (June 1st – June 30th) to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. If Project maintenance activities within 30m of significant wildlife habitats must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to bats. Implement red LED flashing lights on turbines. Light turbines and permanent meteorological/communication towers to the minimum federal standards. Ground-level lights (i.e. buildings, turbine bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. Use of high-intensity lighting spotlights, if required, will be temporary and will be kept to a minimum. Any internal nacelle lighting will only be used when occupied. On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase. Develop a Bird and Bat EEMP in accordance with MNRF's Bats and Bat Habitats (OMNR 2011a) guidance, as outlined in Section 4.0.	The presence of suitable cavity trees within BMA-001, BMA-002, and BMA-003 could not be verified during the site investigation phase of the Project as site access was denied. As such, no site-specific surveys can be conducted at these habitats. The following turbines will be included in the subset of turbines to be monitored as part of the post-construction mortality monitoring for bats, as described in Section 4.0 below: • T1(due to proximity to BMA-001) • T8 (due to proximity to BMA-002) • T9 (due to proximity to BMA-003)				Contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these habitats. See Section 4.0 for more detail on the post-construction mortality monitoring methods.
CBT-001* CBT-002* CBT-003* Colonially-	Wind Turbine (<120m) Access Road (<120m)	Species avoidance of habitat during operational phase.	Protection of colonially-nesting breeding bird habitat (tree/shrub).	Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs. Schedule regular (non-critical) Project	The presence of nest bowls within CBT-001, CBT-002 and CBT-003 could not be verified during the site investigation phase of the Project as site access was denied. As such, no site-specific surveys can be conducted at these habitats. The following turbines will be included in the subset of turbines to be monitored as part of the post-construction mortality monitoring for birds, as described in Section 4.0 below. These turbines will be searched at a minimum frequency of once				Contingency measures will be based on the completion of post-construction mortality monitoring in proximity

Table 2. Summary ofd the Environmental Effects Monitoring Plan for Confirmed or Treated as Significant Wildlife Habitats for the Romney WEC

Feature ID	Infrastructure that Requires Individual Delineation of Feature[1]	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection[2]	Technical and Statistical Value of Data	Reporting Requirements[2]	
Nesting Breeding Bird Habitat (Trees/Shrubs)		Direct mortality through collisions with operational turbines. Spills (i.e. oil, gasoline, grease, and/or drilling frac-out, etc.) during the operational phase.	Minimize the potential for mortality of colonially-nesting birds through collisions with operational turbines. Minimize potential impacts from spills (i.e. oil, gasoline, grease, and/or drilling frac-out, etc.) during the operational phase.	maintenance activities within 30m of significant wildlife habitats during the peak breeding season (April 1st – August 31st) to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. If Project maintenance activities within 30m of significant wildlife habitats must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to colonially-nesting breeding birds. Implement red LED flashing lights on turbines. Light turbines and permanent meteorological/communication towers to the minimum federal standards. Ground-level lights (i.e. buildings, turbine bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. Use of high-intensity lighting spotlights, if required, will be temporary and will be kept to a minimum. Any internal nacelle lighting will only be used when occupied. On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase. Develop a Bird and Bat EEMP in accordance with MNRF's Birds and Bird Habitats (OMNR 2011b) guidance, as outlined in Section 4.0. Develop a spill response plan and train staff on appropriate procedures. Keep emergency spill kits on site. Keep contact information for the MOECC Spills Action Centre in a designated area on-site. Dispose of waste material by authorized and approved off-site vendors.	monthly from April through August. • T1 (due to proximity to CBT-001) • T8 (due to proximity to CBT-002) • T9 (due to proximity to CBT-003)				to these habitats. See section 4.0 for more detail on the post-construction mortality monitoring methods.

Table 2. Summary ofd the Environmental Effects Monitoring Plan for Confirmed or Treated as Significant Wildlife Habitats for the Romney WEC

Feature ID	Infrastructure that Requires Individual Delineation of Feature[1]	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection[2]	Technical and Statistical Value of Data	Reporting Requirements[2]	
				Store hazardous materials in designated areas. Locate all maintenance activities, vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.						
LMS-001* LMS-002* Landbird Migratory Stopover Area	Wind Turbine (<120m)	Species avoidance of habitat during operational phase. Direct mortality through collisions with operational turbines.	Protection of migratory landbird species. Minimize the potential for mortality of migratory landbirds through collisions with operational turbines.	Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs. Schedule regular (non-critical) Project maintenance activities within 30m of significant wildlife habitats during the spring and fall landbird migratory stopover period (March 1st – May 31st and August 1st – October 31st) to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. If Project maintenance activities within 30m of significant wildlife habitats must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to migratory landbirds. Implement red LED flashing lights on turbines. Light turbines and permanent meteorological/communication towers to the minimum federal standards. Ground-level lights (i.e. buildings, turbine bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. Use of high-intensity lighting spotlights, if required, will be temporary and will be kept to a minimum. Any internal nacelle lighting will only be used when occupied. On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase. Develop a Bird and Bat EEMP in accordance	The presence of suitable landbird migratory stopover habitats could not be verified within LMS-001 and LMS-002 during the evaluation of significance phase of the Project as site access was denied. As such, no site-specific surveys can be conducted at these habitats. The following turbines will be included in the subset of turbines to be monitored as part of the post-construction mortality monitoring for birds, as described in Section 4.0. These turbines will be searched at a minimum frequency of once monthly from March through October. • T8 (due to proximity to LMS-001) • T9 (due to proximity to LMS-002)				Contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these habitats. See Section 4.0 for more detail on the post-construction mortality monitoring methods.

Table 2. Summary ofd the Environmental Effects Monitoring Plan for Confirmed or Treated as Significant Wildlife Habitats for the Romney WEC

Feature ID	Infrastructure that Requires Individual Delineation of Feature[1]	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection[2]	Technical and Statistical Value of Data	Reporting Requirements[2]	
				with MNRF's Birds and Bird Habitats (OMNR 2011b) guidance, as outlined in Section 4.0.						
BAL-001 (SCC-F) BAL-002* Bald Eagle Habitat	Wind Turbine (Overlapping[3]) Access Road (Overlapping[3]) Cabling (Overlapping[3]) Construction Disturbance Area (Overlapping[3])	Species avoidance of habitat during operational phase. Direct mortality through collisions with operational turbines.	Protection of bald eagles. Minimize the potential for mortality of bald eagle from collisions with operational turbines. Minimize potential impacts from spills (i.e. oil, gasoline, grease, and/or drilling frac-out, etc.) during the operational phase.	Schedule regular (non-critical) vegetation maintenance activities located in and within 120m of the tertiary zone (as determined by site-specific surveys), to occur outside of the critical period for bald eagles (March 1st - May 15th), whenever possible. If regular vegetation maintenance must occur during the period of March 1st to May 15th, have a biologist confirm birds will not be impacted by maintenance activities. Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs. Schedule regular (non-critical) Project maintenance activities within 120m of significant bald eagle habitat to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. If Project maintenance activities within 120m of significant bald eagle habitat must occur outside of daylight hours during the period of March 1st to May 15th, spotlights will be directed downward and/or away from the features to limit potential light disturbance to bald eagles. Implement red LED flashing lights on turbines. Light turbines and permanent meteorological/communication towers to the minimum federal standards. Ground-level lights (i.e. buildings, turbine bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. Use of high-intensity lighting spotlights, if required, will be temporary and will be kept to a minimum. Any internal nacelle lighting will only be used when occupied. On-site speed limits will be clearly posted,	Post-construction eagle behaviour surveys will be conducted at BAL-001 and at BAL-002 (if the latter is determined to be significant, based on pre-construction survey commitments for this habitat). These surveys will follow pre-construction behavioural study methods and occur for 3 years after the Project becomes operational. The specific survey frequency may be adjusted from year to year, depending on the results of the surveys, if determined appropriate through consultation with the MNRF. Surveys will be conducted in accordance with the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015), the *Bald Eagle Habitat Management Guidelines* (OMNR 1987) and the *Birds and Bird Habitats: Guidelines for Wind Power Projects* (OMNR 2011b). The first behaviour survey conducted in March will confirm if the nest is active and surveys will continue to be conducted twice-weekly from March 1st-August 15th, or until the chick(s) has left the nest. The behavioural study will focus on the flight patterns, sight lines, perching habitat, and foraging habitat of the nesting eagles in order to document the use of habitat zones around the nest. On each survey date, a biologist, using binoculars or a spotting scope, will document and map all activity of the eagle(s) within an 800m radius of the nest for at least 4 hours from suitable vantage point(s) on each visit.	The location of the significant and treated as significant bald eagle habitats can be seen on Maps 3-1 to 3-5. Post-construction monitoring stations will be located in the same locations as pre-construction monitoring stations (see Maps 3-1 to 3-5).	3 years Post-construction Surveys: 1. Mar-Aug 2020 2. Mar-Aug 2021 3. Mar-Aug 2022	Determine the potential disturbance impact of operational wind turbines and overlapping construction disturbance area on significant habitat for bald eagles.	Annual reports or memos summarizing the results of behaviour surveys will be submitted to the MNRF and MOECC following the anticipated schedule below: Post-construction Survey: 1. Mar 2021 2. Mar 2022 3. Mar 2023	An annual report, which documents the results of behaviour monitoring, will be prepared following each year that disturbance monitoring occurs. The report will be submitted to the MNRF and the results presented in these annual reports will be used to determine if any additional mitigation measures should be implemented during the operational phase of this Project (e.g. operational mitigation of the closest turbine (T10 or T16) to the habitat, including turbine shut down during the critical nesting period, specifically during the time of year fledglings are learning to fly). Additional contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these habitats. See section 4.0 for more detail on the post-construction mortality monitoring methods.

Table 2. Summary ofd the Environmental Effects Monitoring Plan for Confirmed or Treated as Significant Wildlife Habitats for the Romney WEC

Feature ID	Infrastructure that Requires Individual Delineation of Feature[1]	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection[2]	Technical and Statistical Value of Data	Reporting Requirements[2]	
				applied, and followed by Project staff throughout the operational phase. Develop a Bird and Bat EEMP in accordance with MNRF's Birds and Bird Habitats (OMNR 2011b) guidance, as outlined in Section 4.0. Post-construction monitoring will be conducted as outlined in the EEMP at the significant bald eagle habitat (BAL-001) for 3 years after the Project has become operational. If BAL-002 is determined to be significant based on pre-construction survey commitments, 3 years of post-construction monitoring will be conducted at this habitat. Develop a spill response plan and train staff on appropriate procedures. Keep emergency spill kits on site. Keep contact information for the MOECC Spills Action Centre in a designated area on-site. Dispose of waste material by authorized and approved off-site vendors. Store hazardous materials in designated areas. Locate all maintenance activities, vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.	In addition to the behavior monitoring outlined above, the turbine located within the tertiary zone of the significant bald eagle habitat, BAL-001, (T10) will be included in the subset of turbines to be monitored as part of the post-construction mortality monitoring for birds and raptors, as described in Section 4.0 below. If BAL-002 is determined to be significant based on pre-construction survey commitments, the closest turbine to this habitat, T16, will be included in the subset of turbines to be monitored as part of the post-construction mortality monitoring for birds and raptors, as described in Section 4.0 below.					
Bird Species of Conservation Concern: EWP-002* (SCC-B) Eastern Wood-Pewee Habitat WTH-001* (SCC-B) Wood Thrush Habitat	Wind Turbine (<120m)	Direct mortality through collisions with operational turbines.	Protection of bird species of conservation concern. Minimize the potential for mortality of bird species of conservation concern from collisions with operational turbines.	Implement red LED flashing lights on turbines. Light turbines and permanent meteorological/communication towers to the minimum federal standards. Ground-level lights (i.e. buildings, turbine bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. Use of high-intensity lighting spotlights, if required, will be temporary and will be kept to a minimum.	The presence of suitable bird species of conservation concern habitats could not be verified within EWP-002* and WTH-001* during the evaluation of significance phase of the Project as site access was denied. As such, no site-specific surveys can be conducted at these habitats. The following turbine will be included in the subset of turbines to be monitored as part of the post-construction mortality monitoring for birds, as described in Section 4.0: • T1 (due to proximity to EWP-002, WTH-001)					Contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these habitats. See Section 4.0 for more detail on the post-construction mortality monitoring methods.

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Feature ID	Infrastructure that Requires Individual Delineation of Feature[1]	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection[2]	Technical and Statistical Value of Data	Reporting Requirements[2]	
				Any internal nacelle lighting will only be used when occupied. Develop a Bird and Bat EEMP in accordance with MNRF's Birds and Bird Habitats (OMNR 2011b) guidance, as outlined in Section 4.0.						
Bird Species of Conservation Concern: EWP-001** (SCC-A) EWP-003** (SCC-D) EWP-004** (SCC-G) EWP-005** (SCC-H) Eastern Wood-Pewee Habitat	Wind Turbine (<120m)	Species avoidance of habitat during operational phase. Direct mortality through collisions with operational turbines. Spills (i.e. oil, gasoline, grease, and/or drilling frac-out, etc.) during the operational phase.	Protection of bird species of conservation concern. Minimize the potential for mortality of bird species of conservation concern from collisions with operational turbines. Minimize potential impacts from spills (i.e. oil, gasoline, grease, and/or drilling frac-out, etc.) during the operational phase.	Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs. Schedule regular (non-critical) Project maintenance activities within 30m of significant bird species of conservation concern habitats during the breeding bird period (May 1st – July 31st) to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. If Project maintenance activities within 30m of significant wildlife habitats must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to breeding birds. Implement red LED flashing lights on turbines. Light turbines and permanent meteorological/communication towers to the minimum federal standards. Ground-level lights (i.e. buildings, turbine bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. Use of high-intensity lighting spotlights, if required, will be temporary and will be kept to a minimum. Any internal nacelle lighting will only be used when occupied. On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase. Develop a Bird and Bat EEMP in accordance with MNRF's Birds and Bird Habitats (OMNR 2011b) guidance, as outlined in Section 4.0. Develop a spill response plan and train staff	Post-construction behaviour surveys will be conducted at each of the habitats if they are determined to be significant, based on pre-construction survey results. These surveys will follow pre-construction survey methods and occur for 3 years after the Project becomes operational. Ten-minute point count surveys will be conducted within each of the candidate habitats for eastern wood-pewee (EWP-001*, EWP-003*, EWP-004*, EWP-005*) in June and early July. Each point count station will be surveyed 3 times during early, mid and late season (spring and early summer) no less than 10 days apart. The number of point counts required within each habitat depends on the size and habitat diversity at each site. Following the *Birds and Bird Habitats Guidelines for Wind Power Projects* (OMNR 2011b), point counts will be spaced at least 250m apart, ideally with the centre point at least 100m from the habitat edge. If more than one point count will be conducted within the habitats, a standardized transect will also be conducted between point count sites. Surveys will be conducted between dawn (one half hour before sunrise) and 3 hours after sunrise. These surveys will occur during a time period when males are expected to be actively singing and defending territories.	The location of each of the significant habitats for bird species of conservation concern can be seen on Maps 3-1 to 3-5. Proposed monitoring locations for pre-construction surveys can be found on Maps 3-1 to 3-5 and will be repeated at the same locations during post-construction surveys.	Post-construction mortality monitoring for birds to occur for a minimum of 3 years once the Project has become operational. Pre-construction Survey (baseline): 1. Jun-Jul 2017 3 years Post-construction Surveys: 1. Jun-Jul 2020 2. Jun-Jul 2021 3. Jun-Jul 2022	Determine the potential disturbance impact of operational wind turbines on significant habitats for bird species of conservation concern.	Annual reports or memos summarizing results will be submitted to the MNRF and MOECC following the anticipated schedule below: Pre-construction Survey (baseline): 1. Dec 2017 Post-construction Survey: 1. Mar 2021 2. Mar 2022 3. Mar 2023	An annual report, which documents the results of behaviour monitoring, will be prepared following each year that monitoring occurs. The report will be submitted to the MNRF and the results presented in these annual reports will be used to determine if any additional mitigation measures should be implemented during the operational phase of this Project. Additional contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these habitats. See section 4.0 for more detail on the post-construction mortality monitoring methods.

Table 2. Summary ofd the Environmental Effects Monitoring Plan for Confirmed or Treated as Significant Wildlife Habitats for the Romney WEC

Feature ID	Infrastructure that Requires Individual Delineation of Feature[1]	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection[2]	Technical and Statistical Value of Data	Reporting Requirements[2]	
				on appropriate procedures. Keep emergency spill kits on site. Keep contact information for the MOECC Spills Action Centre in a designated area on-site. Dispose of waste material by authorized and approved off-site vendors. Store hazardous materials in designated areas. Locate all maintenance activities, vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.	Days with high wind speeds and rain will be avoided. During each visit, the highest observed breeding evidence will be recorded for each species. The closest turbine to these features should be selectively considered in the subset of turbines to be monitored as part of the post-construction mortality for birds, as described in Section 4.0 below. The following turbines will be monitored post-construction if the pre-construction surveys determine the feature to be SWH: • T8 (due to proximity to EWP-003) • T9 (due to proximity to EWP-004) • T13 (due to proximity to EWP-005) • T17 (due to proximity to EWP-001)				

1 As per Table 19 of the NHA Guide (OMNR 2012).
2 Actual post-construction monitoring (and reporting) timelines are subject to change if there are modifications to the construction schedule; however, post-construction surveys will occur during the correct seasonality and during the first year following the completion of construction activities.
[3] The possible bald eagle nest record is located greater than 120m from the Project Location, but has the potential to overlap with Project Infrastructure if an up to 800m buffer is applied to the habitat, which will be determined by the site investigation and/or evaluation of significance surveys completed as part of pre-construction commitments for this feature.
** These habitats have been treated as significant. The significance of these habitats could not be evaluated as site access was denied, and therefore no site-specific results could be collected.*
*** Only if these habitats are determined to be significant through pre-construction surveys described in the Romney WEC NHA Environmental Impact Study (EIS; NRSI 2017).*

4.0 Post-Construction Monitoring for Bat and Bird Mortality

Post-construction mortality surveys are required for all Class 3 and 4 wind power projects. This post-construction monitoring program has been prepared in accordance with MNRF's *Bats and Bat Habitats: Guidelines for Wind Power Projects* (July 2011) and MNRF's *Birds and Bird Habitats: Guidelines for Wind Power Projects* (December 2011).

4.1 Mortality Thresholds

A threshold approach, consistent with MNRF guidelines, will be used to identify and mitigate significant bat and bird mortality resulting from the operation of wind turbines.

4.1.1 Bats

Bat mortality is considered significant when a threshold of annual bat mortality (averaged across the site) exceeds:

- 10 bats/turbine/year

This threshold has been determined based on bat mortality reported at wind power projects in Ontario and through a comparison with other jurisdictions across North America.

4.1.2 Birds and Raptors

Bird mortality is considered significant when a threshold of annual bird mortality exceeds:

- 14 birds/year at individual turbines or turbine groups.

A significant bird mortality event is defined to have occurred when bird mortality during a single mortality monitoring survey (as observed in the field on a single day) exceeds:

- 10 or more birds at any one turbine, or
- 33 or more birds (including raptors) at multiple turbines.

NOTE: These numbers are actual carcasses found (not corrected numbers)

The MNRF will be notified within 48 hours of observation, or no later than 2 business days, if one of the thresholds above is exceeded during a single mortality monitoring survey. MNRF will be consulted to determine appropriate contingency plans should a significant bird mortality event occur or if mitigation actions fail.

Raptor mortality is considered significant when a threshold of annual bird mortality exceeds:

- 0.2 raptors/turbine/year (all raptors) across a wind power project, or
- 0.1 raptors/turbine/year (provincially tracked raptors) across a wind power project.

Provincially tracked raptors are defined as raptors of provincial conservation concern by MNRF's Natural Heritage Information Centre, and include those considered as a species of Special Concern in Ontario or with a provincial status of S1-S3, indicating sensitive populations within Ontario.

4.2 Post-Construction Monitoring Methods

Post-construction bat and bird mortality surveys estimate bird and bat mortality from wind turbines and may identify species and specific periods of high mortality. This knowledge can be used to evaluate the success of mitigation measures, establish protocols for operational mitigation, and inform adaptive management.

Bat and bird mortality surveys identify the number of bats or birds killed per turbine over a known period of time (expressed as bats/turbine/year or birds/turbine/year). This value represents an estimate of bat and bird mortality adjusted for carcass removal rates, searcher efficiency, and percent area searched. Standard methods for mortality surveys are identified below.

For bats and birds, a monitoring year is considered to be from May 1 – October 31, and continues until November 30 specifically for raptor monitoring. Bat and non-raptor bird mortality data collected during the weekly raptor survey period in November will not be included in detailed bat and bird mortality estimates.

Post-construction monitoring is required for 3 years at all Class 3 and 4 wind power projects. Post-construction monitoring will consist of:

- Regular bat/bird mortality surveys around specific wind turbines,
- Monitoring of bat/bird carcass removal rate by scavengers (or other means),
- Monitoring of bat/bird searcher efficiency (i.e. number of bat/bird fatalities present that are actually detected by surveyors),
- Avoidance-disturbance effects monitoring (where the Project is located within 120m of bird/bat significant wildlife habitat),
- For birds, 2 subsequent years of scoped mortality and cause and effects monitoring at individual turbines (and unmonitored turbines in near proximity)

following any given year where an annual post-construction mortality report identifies significant bird or raptor mortality, and
- For birds/bats, an additional 3 years of effectiveness monitoring where mitigation is applied.

All searchers will have updated rabies pre-exposure vaccinations, or will follow an alternative safety protocol for minimizing risks associated with potential incidental contact with animals which may have been exposed to the rabies virus.

4.2.1 Effort and Timing for Bird and Bat Mortality Monitoring

Minimum requirements for post-construction monitoring of birds and bats include:

- Post-construction monitoring (including mortality surveys, carcass removal and searcher efficiency trials) will be conducted during the core season when birds and bats are active (May 1 - October 31) for the first 3 years of wind turbine operation.
- Bat and bird mortality surveys will occur at a sub-sample of at least 30% of installed turbines (minimum 10 turbines). Turbines have been selected to cover representative areas throughout the Project Location, as well as turbines that require monitoring, as outlined in Table 2. See Map 4 for the locations of turbines to be monitored.
- Mortality surveys will be conducted at each monitored turbine twice per week (3 and 4 day intervals) from May 1 – October 31.
- For raptors, mortality monitoring will continue at the selected sub-sample at a frequency of weekly during the month of November, and will occur at all turbines at least once per month from May to November.
- Should significant bat or bird mortality be observed, and operational mitigation implemented, post-construction monitoring will be conducted for an additional 3 years from the implementation of operational mitigation to evaluate the effectiveness of the mitigation.
- The results of weekly November surveys and monthly surveys at turbines not part of the regularly searched sub-sample (if applicable) will not be included in any annual bird or bat mortality estimates (although weekly searches in November will contribute to annual raptor mortality estimates).

The total number of turbines required for monitoring will meet the minimum requirement of 30% of the installed turbines (minimum 10 turbines). In accordance with provincial guidelines, the turbine selection has been completed in a defensible manner and considers factors such as geographic representation, proximity to natural features, significant wildlife habitats, etc. (see Map 4). The turbine selection may vary slightly based on the exact number of turbines built and the results of pre-construction monitoring commitments. Post-construction monitoring will begin on May 1st after the Project is fully operational. The commercial operation date of the Romney WEC is

expected to be in late 2019; therefore, it is anticipated that post-construction monitoring will begin May 1, 2020.

If full Project commissioning is delayed, post-construction monitoring of the partially completed Project will not be delayed for longer than 1 year. If the Project is constructed in phases, monitoring for each phase will coincide with the commencement of operation of that phase. When available, post-construction monitoring data may be useful in considering potential effects on wildlife and wildlife habitats in adjacent phases.

4.2.2 Carcass Searches

Carcass removal by scavengers is highly variable among sites (varying by vegetation cover, terrain and season) and must be considered when estimating total bat and bird mortality. Carcass searches will consider the following:

- Searchers will search for a consistent search time for all surveyed turbines (e.g. 20 minutes per turbine) within each month or season (i.e. for the period that the variables are applied).
- Each surveyed turbine will have a search area that has a 50m radius.
- Within this 50m radius, the search area will be examined using transects 5-6m apart, allowing for a visual search of approximately 3m on each side. The search area may be rectangular, square or circular depending on turbine locations, arrangements and surrounding terrain.
- The search area of each turbine will be mapped into visibility classes according to the following table. Where the majority of the search area would not be searchable due to vegetation cover or other impediments (e.g. Visibility Class 4), these turbines may be purposefully avoided during the selection of the sub-sample of monitored turbines.

%Vegetation Cover	Vegetation Height	Visibility Class
≥90% bare ground	≤15cm tall	Class 1 (Easy)
≥25% bare ground	≤15cm tall	Class 2 (Moderate)
≤25% bare ground	≤25% > 30cm tall	Class 3 (Difficult)
Little or no bare ground	≥25% > 30cm tall	Class 4 (Very Difficult)

- Where possible, ground cover around turbines will be maintained at a low level in order to facilitate more accurate bat and bird mortality surveys.
- Mortality surveys that incorporate the use of trained dogs (i.e., dog handler teams to locate mortalities) to improve searcher efficiency may be considered, particularly in difficult terrain.
- All carcasses found will be photographed and recorded/labeled with species (if possible), sex (if possible), date, time, location (UTM coordinates), carcass condition, searcher, any apparent external injuries, ground cover, and distance and direction to nearest turbine.

- Weather conditions including wind speed and precipitation will be included as part of the data collection.
- The estimated number of days since death, and condition of each carcass collected will be recorded in one of the following categories:
    - Fresh
    - Early decomposition
    - Moderate decomposition
    - Advanced decomposition
    - Complete decomposition
    - Scavenged
- Bird carcasses found during mortality monitoring will be collected and stored in a freezer and used in carcass removal or searcher efficiency trials, assuming they are in reasonable condition.
- Carcasses of the following species found during bat mortality searches will be stored in a freezer and may be used in carcass removal or searcher efficiency trials, assuming they are in reasonable condition:
    - *Lasionycteris noctivagans* (silver-haired bat)
    - *Lasiurus cinereus* (hoary bat)
    - *Lasiurus borealis* (eastern red bat)
- Due to white-nose syndrome contamination risks, the following species will not be used in carcass removal or searcher efficiency trials (carcasses of these species may be sent to the Canadian Cooperative Wildlife Health Centre for analysis of white-nose syndrome):
    - *Myotis septentrionalis* (northern myotis)
    - *Myotis lucifugus* (little brown myotis)
    - *Myotis leibii* (eastern small-footed myotis)
    - *Perimyotis subflavus* (tricolored bat)
    - *Eptesicus fuscus* (big brown bat)

4.2.3 Carcass Removal Trials

The level of carcass scavenging must be determined through carcass removal trials. In these trials, carcasses are placed around the wind turbines and monitored until they disappear. The average carcass removal time is a factor in determining the estimated bat or bird mortality. As carcass removal rates vary considerably from one site to another and seasonally, removal trials will be conducted at every wind power project for every year of monitoring.

Below are some important considerations for conducting carcass removal rate trials:

- Carcass removal trials will be conducted at least once a season, including spring (May/June), summer (July/August), and fall (September/October) during the same period as the mortality surveys. Trials will be conducted more frequently (i.e. once per month) if vegetation changes occur during the season (e.g. crops grow, harvest, etc.).

- A minimum of 10 carcasses will be used for each trial. A maximum of 5 trial carcasses will be placed at any one time to avoid flooding the area with carcasses.
- Carcasses will be monitored every 3-4 days in conjunction with regular carcass searches.
- Carcass removal trials will be conducted in a variety of weather conditions.
- Carcasses will be distributed across the range of different substrates/habitats and visibility classes of turbines being searched.
- To the extent possible, carcass removal trials will be conducted at turbines that are not part of the carcass search sub-sample.
- Carcasses will be placed before dusk using gloves and boots to avoid imparting human smell that might bias trial results (e.g. attract scavengers, etc.).
- Trials will continue until all carcasses are removed or have completely decomposed, for a minimum of 2 weeks (14 days).
- To avoid confusion with turbine related fatalities, trial carcasses can be discretely marked (e.g., clipping of ear, wing, fur; hole punching ear, etc.) with a unique identification so they can be identified as trial carcasses.
- Carcasses used will be as fresh as possible, since frozen or decomposed carcasses are less attractive to scavengers. If frozen carcasses are used, they will be thawed prior to beginning carcass removal trials.
- To the extent possible, bat and bird carcasses should each account for a minimum of one third of the carcass removal trials. Trials using other small brown mammal or bird carcasses (e.g., mice or brown chicks) may also be used when bird and bat carcasses are not available.
- Scavenging rates may change over time as scavengers become aware of and develop search images for new sources of food beneath turbines.
- Scavenging will be determined on a project-specific basis and rates will not be assumed to be similar between sites or used in calculations for other projects.

4.2.4 Searcher Efficiency Trials

Searcher efficiency is another important factor in creating an estimate of total bat and bird mortality. Searcher efficiency trials require a known number of discretely marked carcasses to be placed around a wind turbine. Searchers examine the wind turbine area, and the number of carcasses that they find is compared to the number of carcasses placed. Searcher efficiency will vary considerably for each searcher and from one site to another (varying by vegetation cover, terrain and season), and will be conducted as part of post-construction monitoring at every wind power project for every year of monitoring.

Below are some important considerations for conducting searcher efficiency trials:

- Searcher efficiency trials will be conducted at least once a season (following the same general seasonal periods as identified in Section 4.2.3) during the same

period as the mortality surveys. Trials will be conducted once per month if vegetation changes occur during the season (e.g., crops grow, harvest, etc.).

- A 'tester' will control the trials and return to collect marked trial carcasses at the completion of the trials to determine the number of carcasses remaining and if any carcasses were scavenged or removed during the trial.
- Searcher efficiency trials are to be conducted for each individual searcher or team involved in searching for carcasses (including teams using dogs). The searcher will not be notified when they are participating in an efficiency trial to avoid potential search biases.
- A minimum of 10 carcasses per searcher per season (following the same general seasonal periods as identified in Section 4.2.3) in all applicable visibility classes (see table in Section 4.2.2) are to be used. The average per searcher across all visibility classes will be used for calculations.
- Trial carcasses will be spread out over the trial period (month or season) and conducted with the mortality surveys. A maximum of 3 trial carcasses will be placed at any one time (no more than 2 at any single turbine) to avoid bias and flooding the area with carcasses.
- Trial carcasses are placed for one search day only and then removed and recorded by the 'tester'.
- Trial carcasses will be randomly placed within the search area and location recorded so that they can be retrieved if they are not found during the trial.
- Trial carcasses can be discreetly marked (e.g., clipping of ear, wing, leg, fur; hole-punching ear; etc.) with a unique identification so that they can be identified as a trial carcass by the tester.
- To the extent possible, bird and bat carcasses will each be used for a minimum of one third of the searcher efficiency trials. Trials using other small brown mammal or bird carcasses (e.g., mice or brown chicks) may also be used when bird and bat carcasses are not available.
- If frozen carcasses are used, they will be thawed prior to beginning searcher efficiency trials.
- All observers, even those with trained dogs, will overlook some carcasses. This percentage will vary depending on the observer, the habitat and the area being searched, etc.

4.2.5 Proportion of Area Searched

Based on current Ontario post-construction data, most bats and birds appear to fall within 50m of a wind turbine base. This area therefore represents the maximum recommended search area. Since it may not always be possible to search the entire 50m radius because of the presence of thick or tall vegetation, steep slopes, active cultivation, etc. the actual area searched during the mortality surveys will be calculated at each turbine, using a GPS. A map of the actual search area for each turbine searched, and a description of areas deemed to be unsearchable (e.g. vegetation height, type, slope, etc.), will be provided in the mortality report.

4.2.6 Calculations

Scavenger Correction Factor

The following formula will be used to calculate the overall scavenger correction (S_c) factors based on the proportion of carcasses remaining after each search interval are pooled:

$$S_c = \frac{n_{visit1} + n_{visit2} + n_{visit3}}{n_{visit0} + n_{visit1} + n_{visit2}}$$

Where,

S_c	is the proportion of carcasses not removed by scavengers over the search period,
n_{visit0}	is the total number of carcasses placed, and
n_{visit1} - n_{visit3}…	are the numbers of carcasses on visits 1 through 3.

Searcher Efficiency

Searcher efficiency (S_e) will be calculated for each searcher as follows:

$$S_e = \frac{\text{number of test carcasses found}}{\text{Number of test carcasses placed – number of carcasses scavenged}}$$

The number of turbines that each individual searches may vary, in which case it will be necessary to calculate a weighted average that reflects the proportion of turbines each searcher searched. The weighted average or overall searcher efficiency will be calculated as follows:

$$S_{eo} = S_{e1}(n_1/T) + S_{e2}(n_2/T) + S_{e3}(n_3/T)\ldots$$

Where,

S_{eo}	is the overall searcher efficiency,
S_{e1} and $_2$ and $_3$…	are individual searcher efficiency ratings,
n_1 and $_2$ and $_3$…	are number of turbines searched by each searcher, and
T	is the total number of turbines searched by all searchers.

Proportion Area Searched

Proportion area searched (P_s) is calculated as follows:

$$P_s = \frac{\text{actual area searched}}{\pi r^2}$$

Where r = 50m.

Corrected Mortality Estimates

The minimum estimated bat mortality (C) is calculated as follows:

$$C = c / (S_{e0} \times S_c \times P_s)$$

Where,

C is the corrected number of bat fatalities,
c is the number of carcasses found,
S_{e0} is the weighted proportion of carcasses expected to be found by searchers (overall searcher efficiency),
S_c is the proportion of carcasses not removed by scavengers over the search period, and
P_s is the proportion of the area searched.

4.2.7 Other Considerations

The following additional factors will be taken into consideration during the data analysis and reporting phases associated with the post-construction bird and bat mortality monitoring:

- The above calculations will be presented in corrected number of bats/turbine per year and birds/turbine per year. In this context, the year is from May 1 to October 31 for all bats and birds (non-raptors) and relates to the individuals found at the sub-sample of monitored turbines. The year continues until November 30 specifically for raptor monitoring, and the results from November weekly surveys will be included in the annual raptor mortality estimate.
- All individuals documented during monthly searches and bat or bird (non-raptor) individuals documented during weekly November searches will be considered incidental observations. These results will be used to help inform any required mitigation, scoped mortality monitoring, or cause and effects monitoring that may be required at the facility, but will not be included in any presented estimated mortality rates.
- Should additional bird or bat mortality be reported through supplemental monitoring (e.g., associated with significant wildlife habitat) and using the same standard protocols, these mortalities should be included in the calculation of mortality rates. In this case, a monitoring year will be defined as all reporting periods in a calendar year.
- Tissue samples from bat and bird carcasses may be used in a number of DNA analyses to provide insight into population size and structure, as well as the geographic origin of migrants. The local MNRF office may be contacted prior to disposing of bat and bird carcasses to determine if this type of research is occurring in the area.

4.3 Post-Construction Mitigation

Post-construction mitigation will be implemented if the required post-construction monitoring results indicate that the Project has exceeded the bird or bat mortality thresholds outlined in Section 4.1 above. Post-construction mitigation options include operational mitigation, associated with an additional 3 years of mitigation effectiveness monitoring to evaluate the success of the implemented mitigation.

4.3.1 Bats

Operational mitigation is required if post-construction monitoring shows that a wind power project is causing significant bat mortality. Bat mortality is considered significant when mortality levels at a Project exceed 10 bats/turbine/year.

Operational mitigation refers to adjustments made to the operation of wind turbines to help mitigate potential negative environmental effects on bats (i.e., significant bat mortality). Operational mitigation for bat mortality consists of changing the wind turbine cut-in speed to 5.5 m/s (measured at hub height), or feathering of wind turbine blades when wind speeds are below 5.5 m/s.

The majority of bat mortalities from wind turbine operations occur during fall migration. Across North America, it is estimated that 90% of bat fatalities occur from mid-July through September. Where a post-construction monitoring annual report indicates that the annual bat mortality threshold of 10 bats/turbine/year has been met or exceeded, operational mitigation will be implemented across the wind power project (i.e., at all turbines) from sunset to sunrise, from July 15 to September 30. This mitigation will continue for the duration of the project. Should site-specific monitoring indicate a shifted peak mortality period, operational mitigation may be shifted to match the peak mortality, with mitigation maintained for a minimum 10 weeks. Any shift in the operational mitigation period to match peak mortality should be determined in coordination with and confirmed by MNRF.

Where post-construction mitigation is applied, an additional 3 years of mitigation effectiveness monitoring is required. Monitoring the effectiveness of any post-construction mitigation techniques will help to evaluate the success of this mitigation.

4.3.2 Birds

Post-construction mitigation or additional scoped monitoring may be required at individual turbines or groups of turbines where post-construction monitoring identifies significant annual bird mortality, disturbance effects associated with bird significant wildlife habitat, or significant bird mortality events.

For turbines located outside 120m of bird significant wildlife habitat, 2 years of subsequent scoped mortality and cause and effects monitoring is required where a significant annual mortality threshold has been exceeded. Following scoped monitoring, post-construction monitoring (e.g., operational mitigation) and effectiveness monitoring may be required at individual turbines where a mortality effect has been identified or significant annual mortality persists.

For turbines located within 120m of bird significant wildlife habitat, immediate post-construction mitigation (including operational mitigation), as identified in the EIS, and 3 years of effectiveness monitoring will be required where monitoring identifies significant annual bird mortality or disturbance effects associated with bird significant wildlife habitat.

Operational mitigation techniques may include periodic shut-down of select turbines and/or blade feathering at specific times of the year when mortality risks to the affected bird species is particularly high (e.g., migration). Emerging and new technologies will be considered that may reduce bird fatalities.

4.3.3 Raptors

Post-construction mitigation or additional scoped monitoring may be required at individual turbines or groups of turbines where post-construction monitoring identifies significant annual raptor mortality.

Two years of subsequent scoped mortality and cause and effects monitoring is required where a significant annual mortality threshold has been exceeded. Following scoped monitoring, post-construction monitoring (e.g., operational mitigation) and effectiveness monitoring may be required at individual turbines where a mortality effect has been identified or significant annual mortality persists.

Operational mitigation techniques may include periodic shut-down of select turbines and/or blade feathering at specific times of the year when mortality risks to the affected raptor species is particularly high (e.g., migration). Emerging and new technologies will be considered that may reduce raptor fatalities.

4.4 Contingency Plans

A contingency plan addresses immediate actions necessary in case of a significant bat, bird, or raptor mortality event, or if mitigation actions fail. A contingency plan allows additional mitigation measures to be implemented in the event that unanticipated negative environmental effects are observed during a single mortality monitoring survey.

Should post-construction mitigation be implemented and the bat, bird, and/or raptor mortality threshold continue to be exceeded, additional mitigation and scoped monitoring requirements will be determined in consultation with MNRF.

4.5 Post-Construction Monitoring Reporting Requirements

All mortality data collected during post-construction monitoring will be submitted in accordance with MNRF data standards and templates. Post-construction reports will be prepared and submitted as per Table 3.

Table 3. Schedule for Post-construction Monitoring Reports Detailing Results of the Environmental Effects Monitoring Plan

Monitoring Year*	Report Submission Date
Year 1: May 1 – Nov 30, 2020	February 2021
Year 2: May 1 – Nov 30, 2021	February 2022
Year 3: May 1 – Nov 30, 2022	February 2023

*If additional years of monitoring are required, the additional report submissions will follow a similar schedule as listed above.

All bat and bird monitoring data and associated reports will be submitted to the MOECC and MNRF, consistent with MNRF's procedures and protocols, and satisfy the data standards and requirements of the Wind Energy Bird and Bat Monitoring Database (see Appendix II for data template). Standardized templates available online through the Wind Energy Bird and Bat Monitoring Database (found at: *http://www.bsc-eoc.org/birdmon/wind/wind_templates.jsp)* will be used to record and report all field data. Other similar data sheets may be used, providing they allow for the collection and submission of the same data as the templates identified above. All data sheet templates are provided in Appendix II.

Reports will also include maps of areas searched for each surveyed turbine and raw data for all carcass searches, searcher efficiency trials and carcass removal trials will be submitted as part of the annual report.

A summary of when information about a particular mortality event or threshold is reported to MNRF is included in Table 4.

Table 4. Timeline for Reporting Mortality to the Ministry of Natural Resources and Forestry

Mortality Threshold	How mortality is calculated	Reporting Timeline for Results
10 bats/turbine/year	Based on calculation described in Section 4.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MNRF (within 3 months of completion of mortality surveys) as outlined in Table 3.
14 birds/turbine/year	Based on annual calculation described in Section 4.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MNRF (within 3 months of completion of mortality surveys) as outlined in Table 3.
10 birds/turbine	Single event as observed in the field during monitoring	Mortality event to be reported to MNRF within 48 hours (or within 2 business days) of detection.
33 birds (including raptors) at any multiple turbines	Single event as observed in the field during monitoring	Mortality event to be reported to MNRF within 48 hours (or within 2 business days) of detection.
0.2 raptors/turbine/year (all raptors) across a wind power project	Based on annual calculation described in Section 4.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MNRF (within 3 months of completion of mortality surveys) as outlined in Table 3.
0.1 raptors/turbine/year (provincially tracked raptors) across a wind power project	Based on annual calculation described in Section 4.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MNRF (within 3 months of completion of mortality surveys) as outlined in Table 3.
Endangered and Threatened Bird and Bat Species	Single event as observed in the field during monitoring	Mortality event to be reported to MNRF within 24hrs (or next business day) of a confirmed identification.

5.0 Species at Risk

The Species at Risk in Ontario List (O. Reg. 230/08) will be consulted to determine species listed as Endangered and Threatened in Ontario. Mortality or injury of an Endangered or Threatened bird (including raptor) or bat species will be reported to the MNRF within 24 hours (or next business day) of a confirmed identification of a Species at Risk. Due to the possibility of encountering decomposed or scavenged carcasses, a confirmed identification may sometimes take several days from the date of first observation/collection. All reasonable efforts will be made to determine species identification if a Species at Risk cannot be ruled out. This may include physiological and skeletal measures, circulation of photo(s) to MNRF staff, and/or DNA analysis.

6.0 References

Natural Resource Solutions Inc. (NRSI). 2017. Romney Wind Energy Centre: Natural Heritage Assessment. June 2017.

Ontario Ministry of Natural Resources (OMNR). 2012. Natural Heritage Assessment (NHA) Guide for Renewable Energy Projects. November 2012.

Ontario Ministry of Natural Resources (OMNR). 2011a. Bats and Bat Habitats: Guidelines for Wind Power Projects. First Edition. Queen's Printer for Ontario, Canada. July 2011.

Ontario Ministry of Natural Resources (OMNR). 2011b. Birds and Bird Habitats: Guidelines for Wind Power Projects. First Edition. Queen's Printer for Ontario, Canada. December 2011.

Map 1
Project Location and Natural Features

Map 1

Romney WEC

Project Location and Natural Features

Legend

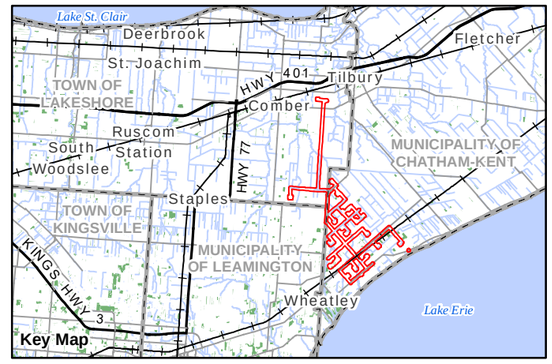
- Utility Line
- Railway
- Highway
- Primary Road
- Secondary Road

Project Components

- 120m Setback
- Project Location
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road
- Proposed O&M Building

Natural Features

- Permanent Watercourse
- Intermittent Watercourse
- Open Water
- Wooded Area



NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project:1736C
Date: June 15, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:68,000

0 1 2 3 4 Kilometers

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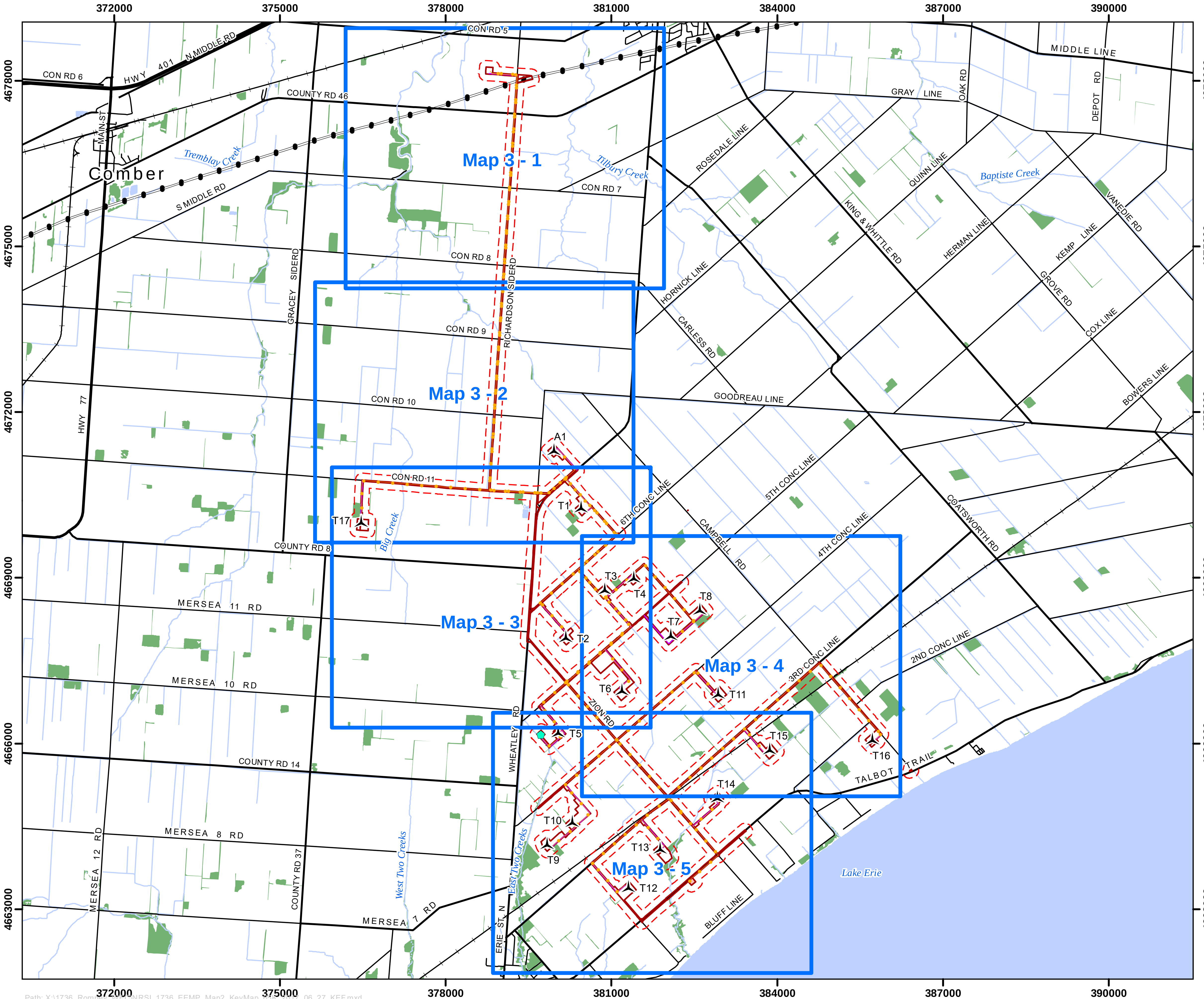
Map 2
Key Map



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Map 2

Romney WEC

Key Map

Legend

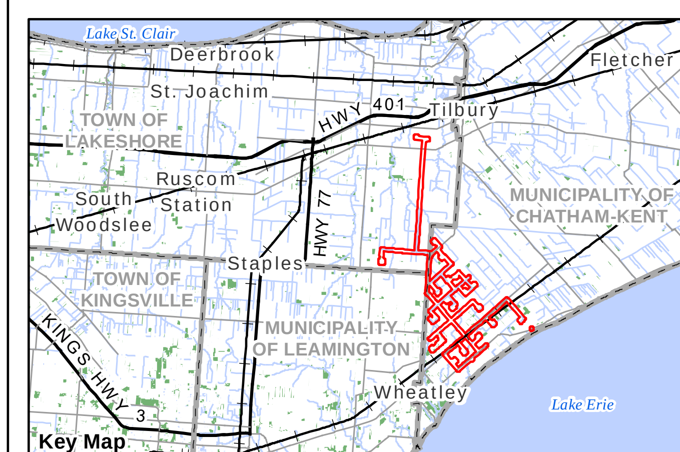
- Map Extent
- Utility Line
- Railway
- Highway
- Primary Road
- Secondary Road

Project Components

- 120m Setback
- Project Location
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road
- Proposed O&M Building

Natural Features

- Permanent Watercourse
- Intermittent Watercourse
- Open Water
- Wooded Area



Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

Project:1736C
Date: June 27, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:68,000

0 1 2 3 4 Kilometers

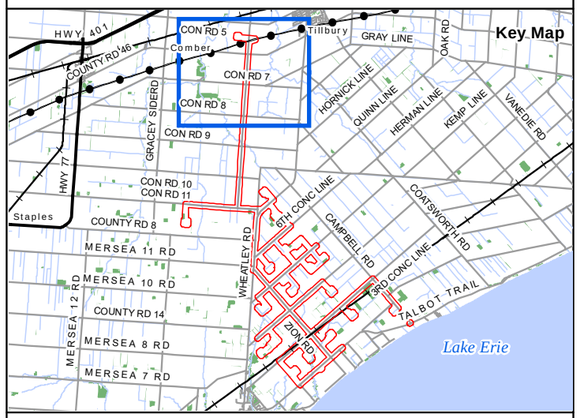
N

Maps 3-1 to 3-5
Significant Bird and Bat Wildlife Habitats

Map 3 - 1

Romney WEC

Significant Bird and Bat Wildlife Habitats



Legend

- Utility Line
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Open Water

Project Components

- 120m Setback
- Project Location
- Proposed Collection Line
- Proposed Access Road

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project:1736 Date: July 7, 2017	NAD83 - UTM Zone 17 Size: 11x17" **1:18,500**

0 400 800 1,200 Meters

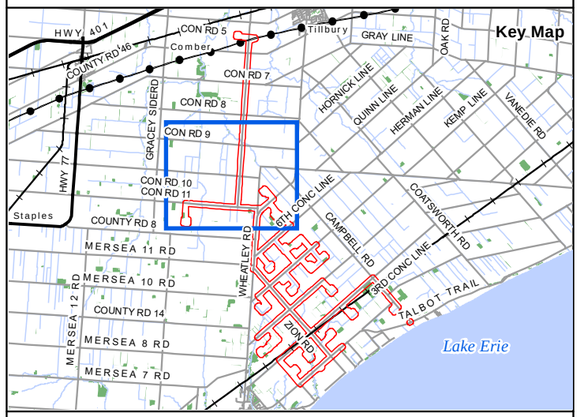
N

Path: X:\1736_Romney_WEC\NRSI_1736_EEMP_Map3-1toMap3-5_BirdAndBat_19K_2017_07_07_LEH.mxd

Map 3 - 2

Romney WEC

Significant Bird and Bat Wildlife Habitats



Legend

- Primary Road
- Secondary Road
- Permanent Watercourse
- Open Water

Project Components

- 120m Setback
- Project Location
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Significant Seasonal Concentration Areas

- Bat Maternity Colony (BMA)
- Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) (CBT)

Significant Habitats for Species of Conservation Concern

- Proposed Bird Monitoring Station
- Significant Habitats for Species of Conservation Concern

1 - Eastern Wood-Pewee

3 - Wood Thrush

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project:1736
Date: July 7, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:18,500

0 400 800 1,200 Meters

N

376000 377000 378000 379000 380000 381000

4674000 4673000 4672000 4671000 4670000

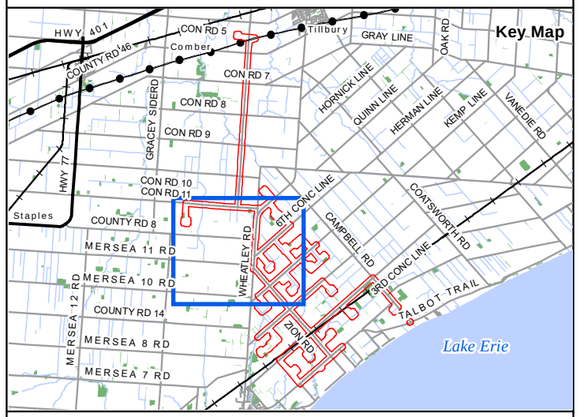
CON RD 9
CON RD 10
CON RD 11
RICHARDSON SIDERD
GOODREAU LINE
CAMPBELL RD
TILBURY W & ROMNEY RD
WHEATLEY RD
6TH CONC LINE
Big Creek
SCC-A (1)
T17
A1
BMA-001
CBT-001
SCC-B (1,3)
T1

Path: X:\1736_Romney_WEC\NRSI_1736_EEMP_Map3-1toMap3-5_BirdAndBat_19K_2017_07_07_LEH.mxd

Map 3 - 3

Romney WEC

Significant Bird and Bat Wildlife Habitats



Legend

- Primary Road
- Secondary Road
- Permanent Watercourse
- Open Water

Project Components

- 120m Setback
- Project Location
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Significant Seasonal Concentration Areas

- Bat Maternity Colony (BMA)
- Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) (CBT)

Significant Habitats for Species of Conservation Concern

- Proposed Bird Monitoring Station
- Significant Habitats for Species of Conservation Concern

1 - Eastern Wood-Pewee

3 - Wood Thrush

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

Project:1736
Date: July 7, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:18,500

0 400 800 1,200 Meters

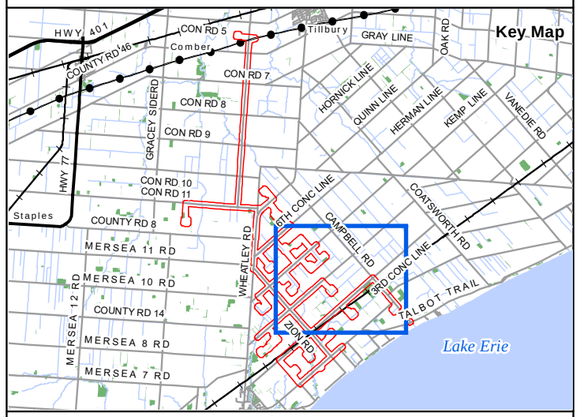
N

Path: X:\1736_Romney_WEC\NRSI_1736_EEMP_Map3-1toMap3-5_BirdAndBat_19K_2017_07_07_LEH.mxd

Map 3 - 4

Romney WEC

Significant Bird and Bat Wildlife Habitats



Legend

- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse

Project Components

- 120m Setback
- Project Location
- Proposed Turbine
- Proposed Collection Line
- Proposed Access Road

Significant Seasonal Concentration Areas

- Bat Maternity Colony (BMA)
- Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) (CBT)
- Landbird Migratory Stopover Area (LMS)

Significant Habitats for Species of Conservation Concern

- Proposed Bird Monitoring Station
- Bald Eagle Nest Record (BAL-002)
- Bald Eagle Survey Location
- Significant Habitats for Species of Conservation Concern

1 - Eastern Wood-Pewee

12 - Bald Eagle

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project:1736
Date: July 7, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:18,500

0 400 800 1,200 Meters

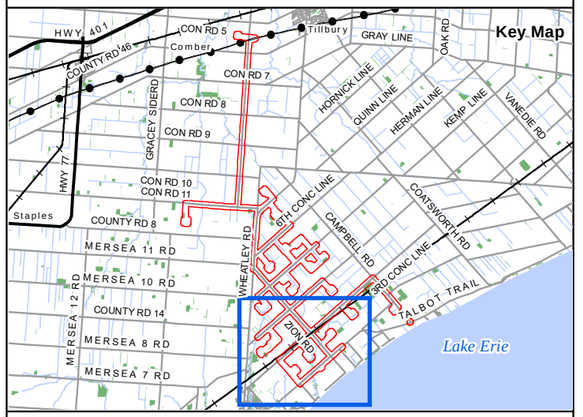
N

Path: X:\1736_Romney_WEC\NRSI_1736_EEMP_Map3-1toMap3-5_BirdAndBat_19K_2017_07_07_LEH.mxd

Map 3 - 5

Romney WEC

Significant Bird and Bat Wildlife Habitats



Legend

- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Open Water

Project Components

- 120m Setback
- Project Location
- Proposed Turbine
- Proposed Meteorological Tower
- Proposed Collection Line
- Proposed Access Road
- Proposed O&M Building

Significant Seasonal Concentration Areas

- Bat Maternity Colony (BMA)
- Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) (CBT)
- Landbird Migratory Stopover Area (LMS)

Significant Habitats for Species of Conservation Concern

- Proposed Bird Monitoring Station
- Bald Eagle Survey Location
- Proposed Bird Monitoring Transect
- Significant Habitats for Species of Conservation Concern

1 - Eastern Wood-Pewee

12 - Bald Eagle

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project:1736
Date: July 7, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:18,500

0 400 800 1,200 Meters

N

Path: X:\1736_Romney_WEC\NRSI_1736_EEMP_Map3-1toMap3-5_BirdAndBat_19K_2017_07_07_LEH.mxd

Map 4
Mortality Monitoring Turbines

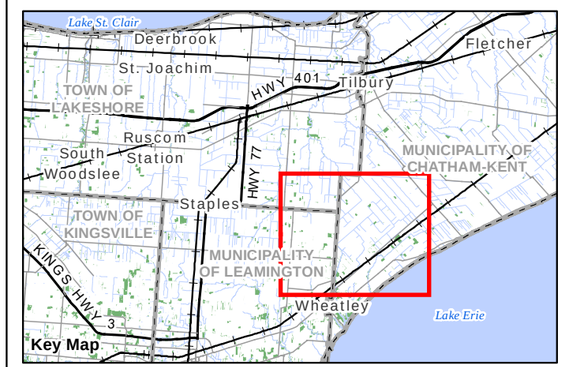
Map 4

Romney WEC

Mortality Monitoring Turbines

Legend

- Monthly Monitored Turbine
- Twice-weekly Monitored Turbine
- Access Road
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Waterbody
- Woodland



NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project:1736C Date: July 6, 2017	NAD83 - UTM Zone 17 Size: 11x17" **1:40,000**

0 500 1,000 1,500 2,000 2,500 Meters

N

Path: X:\1736_Romney_WEC\NRSI_1736_EEMP_Map4_MortalityMonitorting_40K_2017_07_06_KEF.mxd

Appendix I
Romney WEC NHA Letter of Confirmation

Ministry of
Natural Resources
Regional Resources Section
Southern Region
300 Water Street
4th Floor, South Tower
Peterborough, ON K9J 8M5

Ministère des
Richesses naturelles

Ontario

July 11, 2017

Romney Energy Centre Limited Partnership
53 Jarvis Street, Suite 300
Toronto, ON
M5C 2H2

RE: NHA Confirmation for Romney Wind Energy Centre

Dear Mark Gallagher:

In accordance with the Ministry of the Environment and Climate Change's (MOECC's) Renewable Energy Approvals (REA) Regulation (O.Reg.359/09), the Ministry of Natural Resources and Forestry (MNRF) has reviewed the natural heritage assessment (NHA) and environmental impact study (EIS) for the Romney Wind Energy Centre located in the Town of Lakeshore in the Municipality of Chatham-Kent, the final version of which was submitted by Romney Energy Centre Limited Partnership on June 30, 2017.

In accordance with Section 28(2) and 38(2)(b) of the REA regulation, MNRF provides the following confirmations following review of the NHA and EIS:

1. The MNRF confirms that the determination of the existence of natural features and the boundaries of natural features was made using applicable evaluation criteria or procedures established or accepted by MNRF.
2. The MNRF confirms that the site investigation and records review were conducted using applicable evaluation criteria or procedures established or accepted by MNRF, if no natural features were identified.
3. The MNRF confirms that the evaluation of the significance or provincial significance of the natural features was conducted using applicable evaluation criteria or procedures established or accepted by MNRF.
4. The MNRF confirms that the project location is not in a provincial park or conservation reserve.
5. The MNRF confirms that the environmental impact assessment report has been prepared in accordance with procedures established by the MNRF.

In accordance with Section 28(3)(c) and 38(2)(c), MNRF also offers the following comments in respect of the project:

Pre-construction Monitoring

In accordance with Appendix D of the Natural Heritage Assessment Guide, a commitment has been made to complete pre-construction assessments of habitat use for the following candidate significant wildlife habitats:

- Bald Eagle Habitat (features BAL-002*)
- Eastern Wood Pewee Habitat (features EWP-001, 003, 004, 005)
- Cattail Sedge Habitat (features CSE-001, 003, 007)
- Pumpkin Ash Habitat (features PAS-001, 003, 007)
- Halberd-leaved Smartweed Habitat (features HLS-001, 003)
- Shumard Oak Habitat (features SHO-001, 003)

* Feature BAL-002 includes a commitment to determine if a nest is present in the woodland and if so, whether the nest is active. If the nest is present and active, behavioral monitoring is required as a pre-construction survey commitment.

MNRF has reviewed and confirmed the assessment methods and the range of mitigation options. Pending completion of the assessments and determination of significance, the appropriate mitigation is expected to be implemented, as committed to in the EIS.

Post-construction Monitoring

A commitment has been made in the NHA and EIS to conduct post-construction monitoring, and if determined necessary, implement mitigation measures. For the Romney Wind Energy Centre this includes the following features if they are deemed significant following results of pre-construction monitoring requirements listed above:

- Bald Eagle Habitat (features BAL-002)
- Eastern Wood Pewee Habitat (features EWP-001, 003, 004, 005)
- Cattail Sedge Habitat (features CSE-001, 003, 007)
- Pumpkin Ash Habitat (features PAS-001, 003, 007)
- Halberd-leaved Smartweed Habitat (features HLS-001, 003)
- Shumard Oak Habitat (features SHO-001, 003)

In addition, the following confirmed significant wildlife habitats will receive post-construction monitoring, and mitigation outlined in the NHA and EIS will be applied:

- Bald Eagle Habitat (BAL-001)

In addition to the NHA, Environmental Effects Monitoring Plans (EEMP) that address post-construction monitoring and mitigation for birds and bats must be prepared and implemented. EEMPs for birds and bats must be prepared in accordance with MNRF Guidelines and should be reviewed by MNRF in advance of submitting a REA application to MOECC to minimize potential delays in determining if the application is complete. Comments provided by MNRF with respect to the EEMP must be submitted as part of the application for a REA.

This confirmation letter is valid for the project as proposed in the NHA and EIS. Should any changes be made to the proposed project that would alter the NHA or EIS, MNRF may need to undertake additional review of the NHA and EIS.

Where specific commitments have been made by the applicant in the NHA and EIS with respect to project design, construction, rehabilitation, operation, mitigation, or monitoring, MNRF expects that these commitments will be considered in MOECC's Renewable Energy Approval decision and, if approved, be implemented by the applicant.

In accordance with S.12 (1) of the Renewable Energy Approvals Regulation, this letter must be included as part of your application submitted to the MOECC for a Renewable Energy Approval.

Please be aware that your project may be subject to additional legislative approvals as outlined in the Ministry of Natural Resources' *Approvals and Permitting Requirements Document*. These approvals are required prior to the construction of your renewable energy facility.

If you wish to discuss any part of this confirmation or additional comments provided, please contact Mike Poskin, A/Renewable Energy Coordinator, at 705-755-1362.

Sincerely,

Erin Cotnam
Land Use Planning Supervisor
Regional Operations Division
Ministry of Natural Resources and Forestry

cc. Mitch Wilson, District Manager, MNR Aylmer District
cc. Mike Poskin, A/Renewable Energy Coordinator, MNRF
cc. Amy Cameron, Regional Planning Ecologist, MNRF
cc. Kelly Belshaw, Regional Planner, MNRF
cc. Mohsen Keyvani, MOECC
cc. Nick Colella, MOECC
cc. Zeljko Romic, MOECC

Appendix II
Post-Construction Mortality Monitoring Data Sheet Templates

Overview of templates for Natural Heritage Assessment Reports and Post-construction Mortality Monitoring Reports

Report the data from these forms onto the provided Excel templates. Each form correspond to at least one Excel sheet. Refer to the instructions in the Excel templates and at the top of each form.

Post-construction Field Forms

1. Site Description Form (Carcass searches)
2. Site Description and Carcass Distribution Form (Carcass searches)
3. Bird/Bat Carcass Searches Form
4. Searcher Efficiency Trials Form
5. Searcher Efficiency Trials Summary Form
6. Carcass Removal Trials Form
7. Carcass Removal Trials Summary Form

Wind Energy Bird and Bat Monitoring Database (post-construction)

1. Site Description Form (Carcass Searches)

Complete one Site Description Form for each turbine search (i.e. Each turbine sampled, once per season). Every turbine should have a unique turbine number, also referenced in other field sheets. Report each Site Description Form as a record in the data template (site_descr_carcass).

Project name : _____

Province : _____ **Turbine number :** _____

Date completed (dd/mm/yyyy) : _____/_____/ 20____

UTM coordinates of the turbine :

Zone: _____ **Easting:** _____ **Northing :** _____

Slope : _____° **Orientation of slope :** _____ (e.g., SSW)

Required survey area : _____ m^2 (e.g. 7,854 m^2 for 50 m radius)

Transect separation : _____ m

Habitat description :

Distance from the turbine to the following features:

Distance to nearest wood : _____ m

Distance to nearest shoreline : _____ m

Distance to nearest wetland : _____ m

Distance to nearest Significant Wildlife Habitat : _____ m

Type of Significant Wildlife Habitat (eg. hibernacula): _____

Turbine details :

Power : _____ Megawatts

Turbine height (from ground to top of nacelle) : _____ m

Turbine blade diameter : _____ m

Wind Energy Bird and Bat Monitoring Database (post-construction)

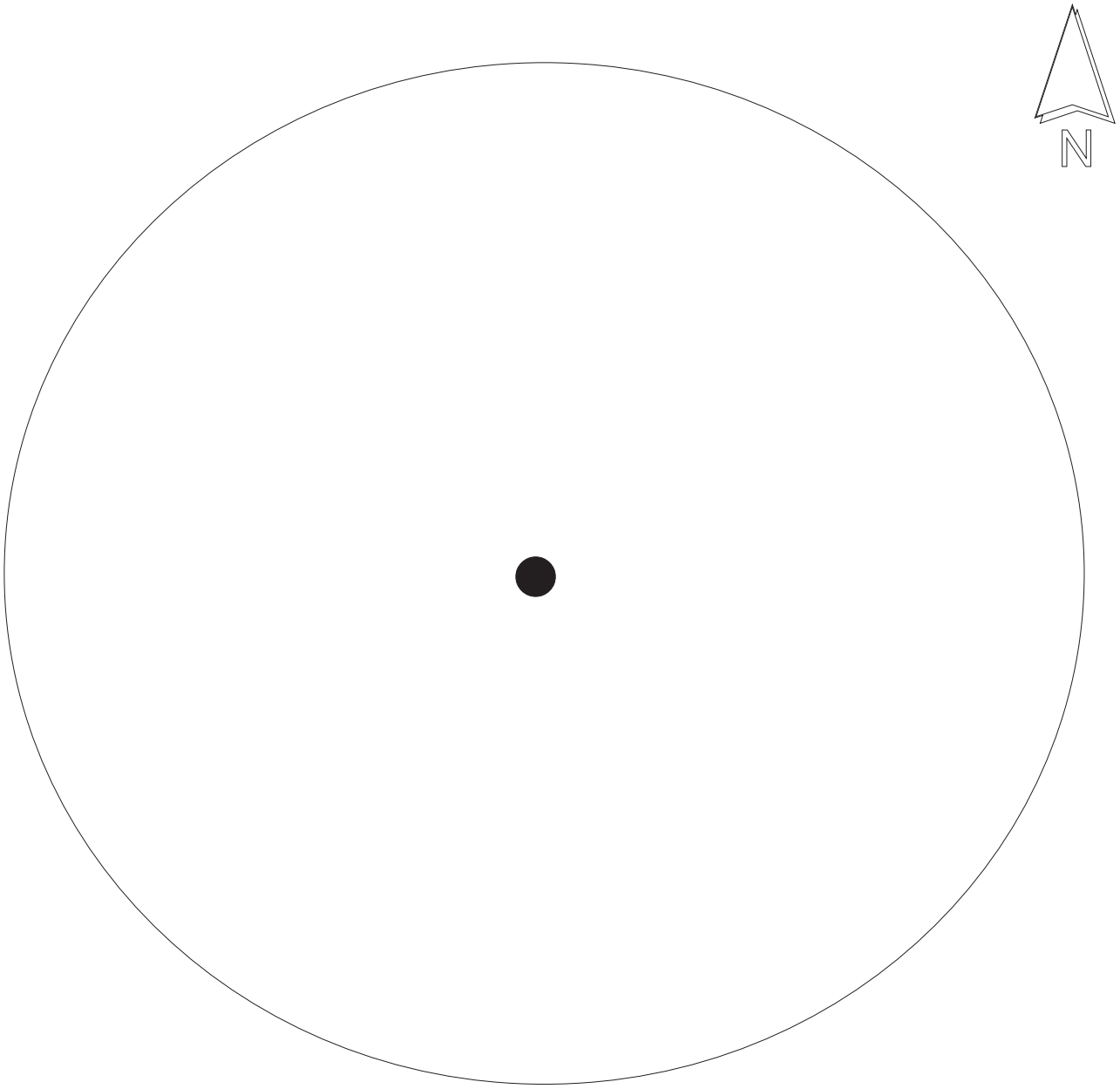
2. Site Description and Carcass Distribution Form (Carcass Searches)

Map the search plot, indicating visibility classes, substrate, carcass locations and area searched
This form should provided for information with the reports, and does not contain information that needs to be transfered to the Excel data templates.

Project name: _____

Site number : _____

Year : _____



Wind Energy Bird and Bat Monitoring Database (post-construction)

3. Bird/Bat Carcass Searches Form

Complete one Bird/Bat Carcass Search Form for every visit to a turbine (i.e. one per day of survey at each turbine). Note that once per season, a Site Description Form must also be completed for each turbine surveyed.

Report the following fields in BOTH the carcass_search_header and the carcass_search_data table templates (once per visit in header, and repeated for each carcass found in data):

Project name : _____ Turbine number : _____

Date of search (dd/mm/yyyy): _____/_____/ 20_____ Start time : ____:____

Report the following fields ONLY in the carcass_search_header table (one record per visit).

End time : ____:____ OR Duration : _____ min Number of searchers : _____

Searcher(s) name : _____

Number of days since last search : _____

Actual area searched : _____ m^2 Dog used (Y/N) : _____

Search method (square or circular) : _____ Transect separation : _____ m

Temperature: _____ °C Wind speed : _____ km/h Wind dir. : _____ Precipitation : _____

Cloud cover : _____% Significant weather (before the visit) : _____

Comments :

species	sex	UTM position (NAD83)		position from turbine		condition (refer to coding sheet)	injuries (refer to coding sheet)	time (hrs) since death	substrate	visibil. (1-4)
		easting	northing	dist. (m)	direct.					

Wind Energy Bird and Bat Monitoring Database (post-construction)

4. Searcher Efficiency Trials Form

One Searcher Efficiency Trials Form should be filled for every searcher or searcher team (e.g. Searcher and dog), once a year. The results should also be summarized for each season using the Searcher Efficiency Trials Summary Form.

Project name: ______________________ **Year:** ________ **Searcher(s) name:** ______________________ **Dog used** (Y/N) ______

date placed dd/mm	time hh:mm	species	condition (fresh/ frozen)	UTM position (NAD83)		position from turbine		marking	weather	scaveng. (Y/N)	found (Y/N)	substrate	visibil. (1-4)
				easting	northing	dist. (m)	direction						

Wind Energy Bird and Bat Monitoring Database (post-construction)

5. Searcher Efficiency Trials Summary Form

Project name: _____ **Year :** _____

Spring (May-June)

Searcher	Number of carcasses placed	Number scavenged	Number found	Proportion found	Proportion turbines searched	**Weighted searcher efficiency Se**
Spring Total					100%	

Summer (July-August)

Searcher	Number of carcasses placed	Number scavenged	Number found	Proportion found	Proportion turbines searched	**Weighted searcher efficiency Se**
Summer Total					100%	

Fall (September-October)

Searcher	Number of carcasses placed	Number scavenged	Number found	Proportion found	Proportion turbines searched	**Weighted searcher efficiency Se**
Fall Total					100%	

Wind Energy Bird and Bat Monitoring Database (post-construction)

6. Carcass Removal Trials Form

One Carcass Removal Trials Form should be filled per season and per project. The results should be summarized in the Carcass Removal Trials Summary Form.

Project name: ______________________________ **Year :** _______ **Turbine number:** __________ **Season :** _______________

date placed dd/mm	species	condit. (fresh/ frozen)	UTM position (NAD83)		position from turbine		visibil. (1-4)	visit 1			visit 2			visit 3			visit 4		
			easting	northing	dist. (m)	direct.		date	weather	scav. (Y/N)	date	weather	scav. (Y/N)	date	weather	scav. (Y/N)	date	weather	scav. (Y/N)

Wind Energy Bird and Bat Monitoring Database (post-construction)

7. Carcass Removal Trials Summary Form

Project name: _____ **Year :** _____

Spring (May-June)

Turbine Number	Number of carcasses placed (N0)	Number of carcasses found per visit			Scavenger correction SC
		N1	N2	N3	

Spring Total

Summer (July-August)

Turbine Number	Number of carcasses placed (N0)	Number of carcasses found per visit			Scavenger correction SC
		N1	N2	N3	

Summer Total

Fall (September-October)

Turbine Number	Number of carcasses placed (N0)	Number of carcasses found per visit			Scavenger correction Sc
		N1	N2	N3	

Fall Total