

7.0 Effects of the Undertaking on the Environment

The potential interactions between the proposed Project and the surrounding environment have been considered in terms of each distinct Project phase and corresponding activities associated with the Project as planned. Interactions due to accidents, malfunctions and unplanned events can be found in **Section 7.5**.

The initial screening (i.e., project interaction matrix) provided in Table 28 assists in determining if an interaction between the proposed Project activities being carried out in each phase and the VEC could occur. A qualitative rating system was used to evaluate if the potential for interactions is possible between the Project and the environment. One of the following two ratings was prescribed for each individual VEC:

- An interaction between the Project and the environment could occur is anticipated (which is identified with as 'x' in the matrix below), which are carried forward for further assessment; or
- No interaction could occur between the Project and the environment (which is identified by a blank cell in the matrix below), and therefore no further assessment is required and the interaction is not discussed further.

Based on the Project description (refer to **Section 2.0**), the VECs (refer to **Section 6.0**), and the scope of the EA, the potential interactions between the Project and the environment are summarized in Table 28 below.

TABLE 28: POTENTIAL PROJECT INTERACTIONS WITH VALUED ENVIRONMENTAL COMPONENTS

Valued Environmental Components		Site Preparation and Construction						Operations & Maintenance		Decommissioning		Accidents, Malfunctions and Unplanned events	
		Clearing and Grubbing	Civil Works	Turbine Foundation	Electrical works	Turbine Installation	Commissioning	Site Restoration	Turbine Operation	Inspection and Maintenance	Infrastructure Removal		Site Reclamation
Physical VECs													
Atmospheric Environment	Weather Conditions												
	Climate and Climate Change								X				
	Ambient Air Quality	X	X	X								X	X
	Ambient Noise Levels	X	X	X		X		X	X		X	X	X
Physical Environmental Setting	Geology	X	X	X									X
	Hydrology	X	X								X	X	X
	Groundwater	X	X									X	X
Visual Environment	Shadow Flicker								X				X
	Visual Aesthetics	X	X						X			X	X
Biophysical VECs													
Terrestrial Environment and Vegetation		X	X	X	X			X		X	X	X	X
Terrestrial Wildlife (including Mainland Moose and other SAR/SoCC)		X	X					X	X		X	X	X
Wetlands		X	X					X				X	X
Birds (including SAR/SoCC)		X	X						X			X	X
Bats (including SAR/SoCC)		X	X						X			X	X
Aquatic Environment	Fish and Fish Habitat ((including SAR/SoCC))	X	X					X				X	X
	Turtle and Turtle Habitat ((including SAR/SoCC))	X	X					X				X	X
Socioeconomic VECs													
Socioeconomic Environment	Economy	X	X	X	X	X	X	X	X	X	X	X	
	Land Use and Value	X	X						X		X	X	X
	Transportation	X	X			X					X	X	X
	Recreation and Tourism	X	X						X			X	X
Human Health and Safety													X
Cultural and Heritage VECs													
Cultural and Heritage Resources	Archaeological and Cultural Resources	X	X	X	X							X	X

7.1 Physical VECs

7.1.1 Atmospheric Environment

The potential interactions between the Project activities during the Project phases and the atmospheric environment are assessed in this section.

7.1.1.1 Weather Conditions

WTGs take up a very small space within the troposphere, the layer of the atmosphere which creates the local weather (National Oceanic and Atmospheric Administration [NOAA] 2021). Although the Project will harness some of the energy produced by the predominant winds at the Project site, the Project itself is not anticipated to interact, or change, the current average weather conditions at the Project site.

7.1.1.2 Climate and Climate Change Potential Interactions and Mitigation

The purpose of the Project is to provide renewable energy to the Province of Nova Scotia to help reach goals of producing 80% of electricity from renewables by the year 2030. By reaching these targets, there will be a significant reduction in greenhouse gas emissions through the reduction of fossil fuel use in the energy sector. This reduction in greenhouse gas emissions will help global efforts of slowing climate change and will help mitigate the associated risks.

Operational wind projects reduce greenhouse gas (GHG) emissions by producing emission-free electricity that would have otherwise been produced by carbon-intensive energy sources, such as coal. This section details the methods and assumptions used to calculate the emission reductions the Project will cause over the operational lifetime.

The methodology followed to complete the GHG emission analysis for the Project follows the international standard ISO 14064-1 and 14064-2. As is standard for this type of analysis, all emission values are presented in tonnes of carbon dioxide equivalent (tCO₂e).

1. Define Project Scenario

The Project consists of 12 wind turbines that collectively produce 50.4 MW of renewable energy. By supplying clean, renewable energy to the Nova Scotia Power Inc. electrical grid, the Project is a GHG emissions reduction project within Nova Scotia. The operational term of the Project is assumed to be 25 years, from 2024 to the end of 2048.

2. Identify Project GHG Sources, Sinks and Reservoirs

The main sources of GHG emissions associated with the Project are during construction. This includes emissions related to manufacturing, installation, and commissioning for all Project components. A secondary source of GHG emissions will be during decommissioning, but this is not included in this analysis because it is difficult to estimate these sources so far in advance, especially since the Project could be retrofitted after the 25 years of assumed operation, rather than being decommissioned.

The main sink for GHG emissions, which reduces the emission rates, is the operational phase of the Project. This is when the Project is producing renewable, emission-free electricity that offsets emission-intensive sources of energy production.

There are no reservoirs associated with the Project.

3. Define Baseline Scenario

In order to quantify GHG emission reductions associated with the Project, a baseline scenario must be established as a reference point from which reductions can be made. In this case, the baseline scenario is a business-as-usual scenario in which the Project is not constructed and the Nova Scotia electricity emission intensities projected by the Government of Canada over what would have been the operational term of the Project are not offset (ECCC 2020a).

This baseline scenario assumes that electricity imports have no emissions and that all fossil fuel based generation in Nova Scotia goes to domestic consumption.

4. Identify Baseline GHG Sources, Sinks and Reservoirs

The main source of GHG emissions associated with the baseline scenario is associated with the existing and projected electricity production sources in Nova Scotia.

There are no sinks or reservoirs associated with the baseline scenario.

5. Calculate Annual GHG Emissions Reduction for Project

Using standard emission factors from the Inventory of Carbon & Energy, Version 2.0; the Idemat App for Material Selection; and Canada's Greenhouse Gas Emissions Projections for Nova Scotia, the annual GHG emissions from each source and sink associated with the Project and the baseline scenarios was calculated. The emission factors are listed in Table 29. This calculation also used the following information:

- The expected annual production in MWh/yr from the Project based on wind data collected on site. This value is confidential at this time, so is not listed here.
- The following information about wind turbine manufacturing and transport:
 - Weight of steel for one wind turbine: 532,000 kg
 - Turbine tower distance traveled by marine cargo: 15,000 km
 - Weight of fibreglass for the blades of one wind turbine: 62,000 kg
 - Turbine blade distance traveled by marine cargo: 5,500 km
 - Weight of concrete for foundations of one wind turbine: 703,000 kg
 - Concrete distance traveled by road: 50 km

TABLE 29 EMISSION FACTORS FOR GHG EMISSION REDUCTION CALCULATIONS

Input	Emission Factor
Electricity generated by wind turbines	0
Steel Production	1.50 kg CO ₂ e/kg
Marine Cargo	15.10 g CO ₂ e/tonne-km
Fibreglass Production	1.4 kg CO ₂ e/kg
Concrete Production	0.30 kg CO ₂ e/kg
Heavy Duty Diesel Truck	135.0 g CO ₂ /tonne-km
Average NS Electricity Production Emission Factor Projected from 2024 to 2048	0.243 t CO ₂ /MWh

The following steps were taken using this information to calculate the annual GHG emission reduction that will result from the Project:

1. Project Scenario:
 - a. Total emissions from Project manufacturing, installation, and commissioning were calculated. This value was then divided by 25 to get an emission value per year of Project operation. This value is 581 tCO₂e/year.
 - b. Annual emissions from Project operation was calculated. This value is 0 tCO₂e/year because it is a non-emitting, renewable source of electricity generation.
2. Baseline Scenario:
 - a. Annual emissions from the Nova Scotia grid from 2024 to 2048 based on the projected emission factor and the expected annual production from the Project were calculated.
3. GHG Emission Reduction
 - a. The annual Project scenario emissions were subtracted from the annual baseline scenario emissions.

Based on the analysis, the Project is expected to reduce GHG emissions from the electrical grid in Nova Scotia by up to 53,896 tCO₂e/year.

The potential interactions of the Project in relation to climate change and proposed mitigative measures are summarized in Table 30.

TABLE 30: POTENTIAL INTERACTIONS & PROPOSED MITIGATIVE MEASURES FOR CLIMATE & CLIMATE CHANGE

Potential Interactions with Climate	Proposed Mitigative Measures
The electricity produced from this Project will supply Nova Scotia with clean renewable energy, reducing fossil fuel use.	<ul style="list-style-type: none"> Reducing reliance on fossil fuels is a positive impact. No mitigation is proposed.
The Project will help the province in achieving renewable energy goals in an attempt to reduce emissions and slow climate change and associated risks.	<ul style="list-style-type: none"> Reducing reliance on fossil fuels is a positive impact. No mitigation is proposed.

Significance of Residual Effects to Climate

The Project will help global long-term efforts to slow climate change and as such, the significance of residual effects on climate is to be considered beneficial. No negative effects of the Project on climate are anticipated.

7.1.1.3 Ambient Air Quality

Potential Interactions and Mitigation

As with any construction project, some emissions to the atmospheric environment are anticipated due to the operation of heavy mobile equipment and vehicles and the release of fugitive dust particles. These emissions are expected during Project activities that require the use of heavy machinery, particularly within the construction (e.g., civil, electrical, install and site restoration) and decommissioning phases of the Project. Potential temporary changes to the local air quality may occur as a result of the generation of emissions of fugitive dust and particulate matter from material movement as well as combustion emissions associated with the heavy equipment. The potential interactions of the Project with the ambient air quality and proposed mitigative measures are summarized in Table 31.

TABLE 31: POTENTIAL INTERACTIONS & PROPOSED MITIGATIVE MEASURES FOR AMBIENT AIR QUALITY

Potential Interactions with Ambient Air Quality	Proposed Mitigative Measures
Vehicle traffic and the use of equipment associated with on-site work and transport of materials on- and off-site could increase emissions of combustion gases and greenhouse gases to the atmosphere during construction and decommissioning phases.	<ul style="list-style-type: none"> Vehicles and equipment will be maintained in proper working order; Vehicles and machinery will comply with current emission standards and will be used efficiently, minimizing distances travelled when possible; Vehicle idling will be minimized where possible; A speed limit will be enforced to reduce unnecessary emissions and enhance safety; Contractor car-pooling will be encouraged; and Low sulphur fuel will be used in combustion engines, when possible.

Potential Interactions with Ambient Air Quality	Proposed Mitigative Measures
Local air quality may be affected through fugitive dust from the access road and earth work activities during construction and decommissioning	<ul style="list-style-type: none"> • Fugitive dust during dry weather conditions may be controlled with the application of water or an environmentally benign dust suppression product along roadways or WTG locations; • Water used to minimize fugitive dust will be obtained from a clean source and, if available, within the local watershed; • Proper air quality control measures following the Environmental Management and Protection Plan (Appendix O) will be instated; and • Earth work activities will be paused, where possible, during periods of significant winds.

Significance of Residual Effects to the Ambient Air Quality

It is noted that heavy mobile equipment and other vehicles are, and will continue to be, used in the Project area due to the ongoing agricultural and forestry operations. As for the Project, not all equipment will be operated at the same time during the different Project phases. Fugitive emissions of particulate matter (including dust) and those associated with fuel combustion in heavy equipment will largely be localized to the construction and decommissioning activities within the immediate area and within the Project site. Due to the limited footprint of the Project, the temporary nature of the activities, the composition of the materials being handled (i.e., soil and gravel) in addition to the rural setting of the Project with the nearest residential receptor being over 1 km away, fugitive emissions, if any, are expected to be minimal, very localized, and are not anticipated to negatively contribute to local or regional air quality. In addition, given the relatively low magnitude of emissions associated with the Project, greenhouse gas emissions are expected to be low and unsubstantial for the scale of the Project.

The Project will help global long-term efforts to slow climate change by producing emission free electricity and as such, the significance of residual effects on ambient air quality is to be considered beneficial.

Given anticipated limited interactions with the ambient air quality, no follow-up or monitoring is proposed to monitor environmental interactions.

7.1.1.4 Ambient Sound Levels Potential Interactions and Mitigation

The Proponent has conducted an operational sound level impact assessment of a 2.0 km area surrounding the proposed turbine locations. This was completed in alignment with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia (NSE 2021) and by modelling the turbine locations, turbine model, receptor locations and local topography using the Decibel module of the WindPRO software v3.5. This assessment includes a total of 61 receptors representing dwellings within 2.0 km of the proposed turbine locations.

Prior to this assessment, careful siting of the turbines has reduced the majority of sound impacts to neighbouring residents. Based on the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia, the maximum allowable sound level from wind turbines at a receptor is 40 dB[A] in Nova Scotia.

The results of the sound level prediction model are summarized in Appendix C. The sound levels at all receptors comply with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia. As such, the modelled sound levels emitted by the Project are less than the maximum of 40 dB[A] at the outside of a receptor. The maximum sound predicted by the Decibel module of windPRO v3.5 at a nearby receptor is 36.6 dB(A) based on the worst-case scenario sound assessment. The worst-case sound assessment followed a conservative methodology in calculating sound levels by assuming downwind propagation is occurring simultaneously in all directions of the wind turbines. In reality, sound propagation in an upwind direction would result in a significant reduction of sound levels at any receptor located upwind from the turbine. A detailed list of the sound assessment assumptions and methodology is included in Appendix C.

Infrasound describes sounds with a frequency less than 20 Hz and can occur when large masses are in motion (Leventhall 2007). In some cases, the movement of wind turbine blades has generated infrasound in the local environment (Bolin et al. 2011). An additional assessment was completed through the Finland Low Frequency module of windPRO v3.5. This assessment showed a minimum frequency of 80 Hz observed at all receptors within 2 km of the Project. The results of the infrasound modeling show that the infrasound is not expected at the receptors since the lowest frequency created by the Project is expected to be much higher than the frequency designated as infrasound (20 Hz or less).

In addition to modelling for infrasound, research was conducted to evaluate its impact on local residents living near wind turbines. The results of this research lead to the review of a study conducted by the Massachusetts Institute of Technology which found that infrasound near wind turbines does not exceed audibility thresholds. However, epidemiological studies have shown a relationship between living near turbines and annoyance. Annoyance seems strongly related to the individuals' characteristics rather than noise from turbines. The studies also established that infrasound and low-frequency sound do not present unique health risks. (McCunney et al. 2012)

Construction noise is not always constant and can produce impulsive and variable sounds at different noise levels, which could create heightened annoyance levels in the surrounding community. The construction noise assessment has considered the maximum noise levels produced by various construction equipment to determine maximum sustained noise levels when all expected equipment is running.

General construction activities include those associated with vegetation clearing, road building, foundations, and turbine erection or decommissioning. These activities will likely involve the use of backhoes, concrete mixers and pumps, cranes, dump trucks, excavators and light-duty pick-up trucks with the associated sound levels predicted in Table 32. General construction sounds could be occurring in addition to the noise generated from current onsite activities (e.g. agricultural and forestry activities).

TABLE 32: SOUND POWER LEVELS ASSOCIATED WITH CONSTRUCTION EQUIPMENT

Equipment	Max Sound Power Level (dB{A})
Backhoe	78
Concrete Mixer	79
Concrete Pump	81
Crane	81
Dump Truck	76
Excavator	81
Pick-up Truck	75

Source: WSDoT (2017)

In addition, occasional blasting may be associated with impact equipment use and that noise can reach 126 dBA (WSDoT 2017); however blasting is anticipated to occur infrequently and be of short duration. It is not expected that all equipment would be running at the same time, but to determine maximum expected sound levels during construction, the WSDoT (2017) guidelines for decibel addition were used to conclude that 86 dB[A] is the highest expected sound level during combined construction activities.

The environment in which the Project construction will occur is considered a soft environment with normal unpacked earth. The normal unpacked earth and topography will facilitate attenuation of noise emissions at shorter distances. Table 33 identifies the sound levels predicted to be observed at various distances from the construction site determined using WSDoT (2017) guidelines.

TABLE 33: WORST-CASE SOUND LEVELS IN THE SURROUNDING ENVIRONMENT

Distance	Construction Sound Level (dB[A])
50 ft. (15.2 m)	86
100 ft. (30.5 m)	78.5
200 ft. (61 m)	71
400 ft. (122 m)	63.5
800 ft. (244 m)	56
1600 ft. (488 m)	48.5
3200 ft. (975 m)	41

* Assumes sound levels in soft environment attenuates at -7.5 dB[A] per doubling of distance, calculated using WSDoT (2017) guidelines

Many sound level scales refer to 70 dB[A] as an arbitrary base of comparison where levels above 70 dB[A] can be considered annoying to some people (Purdue University 2017). As indicated in Table 33, at 61 m from the construction site, noise levels are approximately 70 dB[A], similar to that of a car travelling at 100 km/h and just at the threshold of possible annoyance (Purdue University 2000). Also indicated in Table 33, sound levels from the construction site reach approximately 40 dB[A] at 1 km from the site. With the nearest dwelling located over 1 km from a proposed turbine, construction noise

is not expected to impact dwellings in the area. Further, the construction noise is not expected to be annoyingly high beyond 61 m from the construction site as sound levels at this distance have already attenuated to approximately 70 dB[A].

Additionally, this site has been chosen due to its excellent wind resource. Wind generally increases ambient sound levels in an area and in combination with the vegetative cover will aid in making construction noise less noticeable at even shorter distances (WSDoT 2017). Dense vegetation is estimated to reduce noise levels by as much as 5 dB for every 100 ft (30.5 m) and wind is estimated to reduce noise levels by as much as 20-30 dB at long distances (USDOT 1995).

The potential interactions of the Project with the ambient sound levels and the proposed mitigative measures are summarized in Table 34.

TABLE 34: POTENTIAL INTERACTIONS & PROPOSED MITIGATIVE MEASURES FOR AMBIENT SOUND LEVELS

Potential Interactions with Ambient Sound Levels	Proposed Mitigative Measures
<p>Sound levels generated during operation of the wind turbines has the potential to disturb receptors within the surrounding area.</p>	<ul style="list-style-type: none"> • A sound level impact assessment has been conducted that shows the worst-case scenario sound levels that can be expected at nearby dwellings are below provincial guidelines of 40 dB{A}; • A complaint resolution plan has been developed to address sound level concerns; • Turbine locations have been sited in order to comply with provincial wind turbine sound level guidelines; • The wind turbine model selected for the Project will incorporate noise reduction technologies to mitigate sound levels generated by the moving blades, if feasible; and • Clearing of flora on the Project site will be minimized to aid in attenuation of sound levels.
<p>Sound levels generated during site preparation and construction, and decommissioning activities by the use of equipment and machinery has the potential to disturb receptors within the surrounding area.</p>	<ul style="list-style-type: none"> • Site preparation, construction, and decommissioning activities will be limited to daytime hours, when feasible; • A complaint resolution plan has been developed for handling sound level concerns; • Proper sound level management measures following the Environmental Management and Protection Plan (Appendix O) will be instated; • Clearing of flora on the Project site will be minimized to aid in attenuation of sound levels; and • Construction schedules will be provided to nearby residents and posted on the signage at the entry to the site prior to the commencement of construction activities.

Potential Interactions with Ambient Sound Levels	Proposed Mitigative Measures
Infrasound from the wind turbines during operation has the potential to disturb receptors within the surrounding area.	<ul style="list-style-type: none"> Infrasound from wind turbines is not anticipated to be a concern based on the project modeling and given the distance the wind turbines are located relative to dwellings.

Significance of Residual Effects

Elevated sound levels caused by the construction and decommissioning phases will be temporary, during the day when possible, and short term. Sound level production from the turbines during operation have been mitigated by setback distances and confirmed by a sound level impact assessment. By using the mitigation identified above, the Project is not anticipated to have any significant residual environmental effect on sound levels for humans or wildlife outside the Project site. While any effect on ambient noise will be negative, the significance of residual effects on ambient noise is considered negligible and no follow up monitoring post-construction is recommended.

7.1.2 Physical Environment

7.1.2.1 Geology

Potential Interactions and Mitigation

The construction of the Project will require the excavation of material in order to support the turbine foundations, and the grading and filling for the crane pads and access roads. The geophysical conditions will be disturbed during the construction phase of the Project.

The potential interactions of the Project with geology and the proposed mitigative measures are summarized in Table 35.

TABLE 35: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR GEOLOGY

Potential Interactions with Geology	Proposed Mitigative Measures
Soil and ground conditions may need to be altered or blasted for construction.	<ul style="list-style-type: none"> A geotechnical survey will determine the ground conditions and any potential limitations to construction; A designated professional will provide recommendations for design and construction of the Project based on the geotechnical surveys; and explosives required for blasting will not be stored onsite. Should blasting be required a certified professional will be engaged to conduct the work.
Excavation and transportation of material will be required for turbine foundations, crane pads and access roads.	<ul style="list-style-type: none"> Topsoil will be stored separately from excavated material; Topsoil and excavated material will be backfilled in a manner that does not result in soil inversion; Areas susceptible to erosion will be stabilized and erosion will be minimized through the use of control measures (i.e. hay bales, coco mats, etc.); Soil compaction will be limited to the Project footprint; Soil and aggregate mixing will be minimized; and

Potential Interactions with Geology	Proposed Mitigative Measures
	<ul style="list-style-type: none"> Soil will be visually and olfactory inspected during earth moving activities and identification of any contaminated soils will be reported to NSE and managed utilizing Nova Scotia Contaminated Site Regulations.

Significance of Residual Effects

It is expected that there will be disturbance to the local geophysical conditions for each WTG, the substation and at localized areas for the access roads. The impact is predicted to be of small magnitude and within the immediate area of the site infrastructure. The significance of residual effects on geology after applied mitigation measures is considered to be negligible and no follow up monitoring is recommended unless contaminated soil is encountered from other land uses, such as the active forestry activity, in which case, it will be managed utilizing Nova Scotia Contaminated Site Regulations.

7.1.2.2 Surface Water

Potential Interactions and Mitigation

Interactions with surface water from physical alterations of the Project areas during the construction and decommissioning phases could potentially occur. The most likely potential interaction will be changes in the flow of surface water across the Project areas due to road construction and road upgrading activities that occur in or next to streams and that change the topography of the area. The interaction may also occur during clearing and grubbing, and access road and laydown area construction, as well as during eventual infrastructure removal and site reclamation activities.

The potential interactions of the Project with surface water and the proposed mitigative measure are summarized in Table 36.

TABLE 36. POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR SURFACE WATER

Potential Interactions with Surface Water	Proposed Mitigative Measures
Vegetation clearing, grubbing, excavation and machinery traffic during the construction, road widening and construction, and decommissioning phases have the potential to induce a change in hydrology or sediment input into surface water.	<ul style="list-style-type: none"> A plan for handling fill and construction materials for the site will be communicated to the contractor (i.e., if stockpiling is required, materials will be stored away from any watercourse or removed from site to a predetermined location) with an intent to minimize soil stockpiled, and the duration that soil is stockpiled at the site; Fill and excavated materials will only be stockpiled for limited periods of time to reduce the likelihood of sedimentation; Weather will be monitored and additional erosion control measures such as the installment of hay bales and check dams/silt fences will be employed, as appropriate, should stockpiled fill be present in unexpected heavy rain events; Work will not be conducted during heavy rain events to minimize the movement of exposed soils, where practical;

Potential Interactions with Surface Water	Proposed Mitigative Measures
	<ul style="list-style-type: none"> • Exposed soils will be stabilized as soon as practical to minimize emissions of fine particulate matter and soil erosion; • Culverts will be designed and installed to allow surface water flow conveyance and maintain bankfull channel functions. In stream work will be timed to occur in the dry season and not during significant rainfall; • A NSECC watercourse alteration permit will be obtained prior to any work within a watercourse; • A Request for Review will be submitted to DFO under the Fisheries Act if required; • Work will be completed away from watercourses where possible and water course crossings will be minimized to the extent possible • Surface earth work and other potential activities related to surface water crossings (e.g. culverts) will be conducted in such a way that general overland flow directions are maintained such that water from one watershed does not cross a natural boundary and enter a separate watershed; and, • Where possible, exiting roads that cross water courses will not be widened.

Significance of Residual Effects

Construction activities during the Construction and Decommissioning Phases have the potential to result in changes to surface water without the proper mitigation. Interactions are not expected during the Operation and Maintenance phase due to the passive nature of that phase. Construction activities are not anticipated to occur in watercourses, however if required will be minimized to the extent possible and a watercourse Alteration permit will be obtained in advance. With the implementation of the planned mitigation indicated above interactions between the Project and surface water are not anticipated to be substantive and are limited to the local environment temporarily during the construction and decommissioning phases.

Should Project activities be required directly within watercourses, either further assessment or follow-up or monitoring may be required to monitor environmental interactions with the physical environment.

7.1.2.3 Groundwater Potential Interactions and Mitigation

Potential interactions with groundwater may occur during the clearing and grubbing activities for the construction of the access roads and infrastructure areas, as well as during eventual Project decommissioning and site reclamation activities. In addition, excavations to below ground level during the construction phase of the Project for turbine foundations have the potential to result in interactions with groundwater.

A geotechnical investigation will be conducted for the Project and if shallow groundwater is encountered during these surveys, depth to groundwater will be recorded. Due to the considerable

distance between the Project site, Wellhead Protection Areas, Protected Water Areas, and residential areas (i.e., 1 km from the nearest proposed WTG location), there are not expected to be interactions with the Wellfield or local drinking water supplies.

The potential interactions of the Project with groundwater and the proposed mitigative measures are summarized in Table 37.

TABLE 37: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR GROUNDWATER

Potential Interactions with Groundwater	Proposed Mitigative Measures
Vegetation clearing, grubbing, excavation and machinery traffic during the construction and decommissioning phases have the potential to induce a change in the local groundwater.	<ul style="list-style-type: none"> • Where possible, clearing will take place in the winter months on frozen ground; • Where water must be pumped out of excavation pits, it will not be discharged into a wetland, watercourse or defined channel. If pumped water contains total suspended solids the water will be pumped to vegetated land with gentle slope to allow sediment to filter, or the water will be filtered before release with a filter bag; and • Used oil filters, grease cartridge containers and other products associated with equipment maintenance will be collected and disposed of in accordance with regulatory guidelines.

Significance of Residual Effects

After employing the proposed mitigative strategies, should any disturbance to groundwater occur during construction or decommissioning it is anticipated to be temporary, of small magnitude and contained. While any direct release into groundwater would be a negative effect, it will be of small magnitude, of short duration and localized. The significance of residual effects on groundwater is considered minor.

No follow-up or monitoring is proposed to monitor environmental interactions with the groundwater, unless required under permit from NSECC.

7.1.3 Visual Environment

7.1.3.1 Shadow Flicker

Potential Interactions and Mitigation

The Proponent has conducted an operational visual impact assessment of a 2.0 km area surrounding the proposed turbine locations. Prior to this assessment, careful siting of the turbines has reduced the majority of visual impacts to neighbouring residents by applying sufficient setbacks. The visual assessment included a shadow flicker study. The study was carried out assuming the largest turbine model under consideration for the Project to model a worst case scenario.

A total of 61 receptors were included in the shadow flicker assessment representing the 61 buildings located within 2.0 km of a proposed turbine. This assessment was completed in alignment with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia and by modelling the turbine locations, turbine model, receptor locations and local topography using the Shadow module of the WindPRO software v3.5. The predicted shadow flicker levels at every receptor

comply with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia under the 'sunlight hours accounted worst case' assessment. As such, the modelled shadow flicker emitted by the Project is less than the maximum of 30 hours per year and 30 minutes a day at any receptor based on conservative conditions.

The model assumptions for the 'sunlight hours accounted worst case' assessment and the 'worst case' assessment are largely the same. These assumptions include that the turbines are always in operation, the wind is blowing such that the turbine blades are facing all 61 receptors during all sunlight hours, and each receptor is a greenhouse made of windows 3 m high by 3 m wide. Both assessments also include all 16 proposed turbine locations, whereas only up to 12 of these will be developed. The only difference between the two models is that the 'worst case' assessment assumes the sun is shining, unobstructed, from sunrise to sunset; whereas the sunlight hours accounted worst case' assessment applies statistical data for sunlight hours per month.

Under 'sunlight hours accounted worst case' assessment conditions, the maximum shadow flicker predicted at a receptor is 23 hours and 20 minutes per year.

A detailed list of the assumptions made for the assessment are included in Appendix D.

As summarized in Appendix D, Natural Forces is confident that receptors will not receive excessive amounts of shadow flicker and will work closely with the homeowners and businesses to observe occurrences of real-case shadow flicker impact during operation and apply mitigation as mentioned.

The potential interactions of the Project on shadow flicker and the proposed mitigative measures are summarized in Table 38.

TABLE 38: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR THE VISUAL ENVIRONMENT

Potential Interactions with Shadow Flicker	Proposed Mitigative Measures
<p>Shadow flicker may occur during certain weather conditions and times of the year.</p>	<ul style="list-style-type: none"> • The potential negative effect of shadow flicker has been largely mitigated at the design stage through responsible turbine siting; • A shadow flicker assessment has been completed for dwellings within 2.0 km of the proposed turbines; • Compliance with industry standard guidelines on shadow flicker has been achieved under semi realistic conditions. All dwellings will experience less than 30 hours of shadow flicker per year and 30 minutes of shadow flicker on the worst day; • If shadow flicker occurrences during operation are found to be exceeding guidelines and annoying to surrounding houses and buildings, screening receptors may be considered as detailed in Appendix D; and • A Compliant Resolution Plan has been developed for residents to refer to if they have concerns about any shadow flicker observed during operation.

During Project operation, shadow flicker concerns from local residents is expected to be limited due to the distance between the Project site and nearest potential receptor, which is over 1 km.

While any effect from shadow flicker could be negative, the significance of residual effects is anticipated to be minor due to the limited amounts of shadow flicker expected at nearby receptors under semi-realistic case scenario conditions. No cumulative effects are expected to occur with respect to shadow flicker and no further monitoring or modelling are recommended.

7.1.3.2 Visual Aesthetics Potential Interactions and Mitigation

The Proponent has conducted an operational visual impact assessment of a 2.0 km area surrounding the proposed turbine locations. Prior to this assessment, careful siting of the turbines has reduced the majority of visual impacts to neighbouring residents by applying sufficient setbacks. The visual assessment includes a Zone of Visual Influence (ZVI) assessment and a photomontage. These studies were carried out assuming the largest turbine model under consideration for the Project and all 16 turbine locations to model a worst case scenario.

The Zone of Visual Influence (ZVI) study acts to determine the locations in the surrounding area where the Project will be visible and to what extent under worst case conditions, meaning that no vegetation cover or other screening is considered. The ZVI assessment considers the impact on the existing landscape and shows the expected number of turbines visible from a point. The mapping shows that while the turbines will be largely visible from much of the surrounding landscape. A map showing the results of this assessment are included in Appendix D.

The Photomontage study demonstrates how the Project will be visible on the landscape from a nearby location used by community members. The photomontage photo was taken from Wentworth Collingwood Road. On the current photomontage of the 16-turbine layout, 12 turbines are visible from the selected location. This number includes turbines in full and partial view. The photomontage is included in Appendix D.

While the Project is operational, lighting could be visible on top and mid-way up the turbine tower during the night. The lighting intensity and flashes will be minimized, as allowable by Transport Canada; and the exterior turbine maintenance lights will be turned off prior to maintenance staff leaving the site.

The potential interactions of the Project on shadow flicker and the proposed mitigative measures are summarized in Table 39.

TABLE 39: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR VISUAL AESTHETICS

Potential Interactions with Visual Aesthetics	Proposed Mitigative Measures
While the wind project is operational, lighting could be visible on top and mid-way up the turbine tower during the night.	<ul style="list-style-type: none"> • LED lighting will be used to minimize light throw; • Only the minimum amount of pilot warning and obstruction avoidance lighting will be used; • Only lights with short flash durations and the ability to emit no light during the 'off phase' of the flash

Potential Interactions with Visual Aesthetics	Proposed Mitigative Measures
	<p>(i.e. as allowed by strobes and modern LED lights) will be installed on turbine structures;</p> <ul style="list-style-type: none"> Lights will operate at the minimum intensity and minimum number of flashes per minute (longest duration between flashes) allowable by Transport Canada; and Exterior turbine maintenance lights will be turned off prior to maintenance staff leaving the site.
During the construction period, lighting required during construction activities in the dark could temporarily alter the night-time visual landscape.	<ul style="list-style-type: none"> Construction activities will be limited to the day time when possible. It is noted that the turbine may be erected during the evening as the activity must be completed when the wind is less than 8 m/s as a safety measure. These conditions are commonly seen in the early evening; and Onsite lighting will be pointed downward to minimize light throw.
Community members may have a negative reaction towards the aesthetics of the wind turbines during operation.	<ul style="list-style-type: none"> The Proponent considered landscape aesthetics when deciding on specific siting of the turbines; The paint on the turbines will be selected such that it does not contrast sharply with the environment and minimizes blade glint; and Policies regarding responsible siting of wind turbines were followed to minimize the potential impact on the landscape aesthetics during siting.

Significance of Residual Effects

The potential for impacts during project construction from work lighting, if necessary, will be temporary and of short duration. Impacts to the visual landscape during the construction phase are not anticipated.

During Project operation, lighting concerns from local residents is expected to be limited due to the distance between the Project site and nearest potential receptor, which is over 1 km.

The perception of landscape aesthetics is a subjective matter. The Proponent recognizes the development of the proposed wind turbines may have a negative effect within the perception of the community however through siting and construction materials has mitigated the potential impact to the visual landscape as much as is feasible.

While any effect on the visual aesthetics of the land could be negative, the significance of residual effects is anticipated to be minor. No cumulative effects are expected to occur with respect to visual aesthetics and no further monitoring or modelling are recommended.

7.2 Biophysical VECs

7.2.1 Terrestrial Habitats and Vegetation

Potential Interactions and Mitigation

Potential interactions with terrestrial habitats and vegetation may occur during the clearing and grubbing activities for the construction of the access roads and infrastructure areas, as well as during eventual Project decommissioning and site reclamation activities. In

addition, vegetation clearing may be required for maintenance during the operational phase of the Project. Protecting vegetation and plant biodiversity is an important and integral aspect of maintaining a diverse ecosystem. In an effort to preserve local flora species and to ensure flora species of conservation concern remain unharmed, vegetation has been identified as a VEC.

Information collected during field surveys has covered the main habitat types of the LAA. Habitat types are outlined in **Section 6.2.1**. Two SAR/SoCC plants were identified in the Terrestrial LAA: Eastern waterfan (*Peltigera hydrothyria*) and large purple fringed orchid (*Platanthera grandiflora*). According to NSDNRR (2019), Eastern waterfan is an aquatic lichen classified as a “very rare, and highly sensitive lichen”. As such, based on NSDNRR At-Risk Lichens–Special Management Practices (2018), a protected zone within a 200 m radius of the lichen observed location is managed for minimal disturbance. The SAR and SoCC plants were identified in areas of the PDA along a proposed collector line route. The locations of the SAR and SoCC plants will be avoided by adjusting utility pole alignment to buffer these species, where feasible, or spanning their locations by utility poles and refraining from clearing vegetation in their vicinity.

There will be some loss of vegetation for the construction of turbines and the upgrading, widening and construction of access roads but any areas of disturbance not required for the operations of the Project will be revegetated upon site restoration.

The potential interactions of the Project on vegetation and the proposed mitigative measures are summarized in Table 40.

TABLE 40: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR VEGETATION

Potential Interactions with Vegetation	Proposed Mitigative Measures
<p>Earth works (clearing and grubbing) will result in the disturbance of vegetation and habitat during construction and reclamation.</p>	<ul style="list-style-type: none"> • Proper vegetation management measures following the Environmental Management and Protection Plan (Appendix O) will be instated; • Through the site selection process, the Project footprint has been sited predominantly in areas previously disturbed via clear cutting through forestry activities, creating a highly fragmented habitat and the project footprint is limited, to the extent possible, in areas of undisturbed habitat; • The area to be disturbed by the Project will be minimized to the extent possible (i.e., limited to the area that is required to accomplish the Project objectives only); • Following the construction and decommissioning phases of the Project, natural revegetation of the site will be promoted; • There will be minimal land/habitat loss attributable to the construction phase; • The access roads have been optimized to make use of existing roads at the Project site to reduce the amount of flora to be cleared; and, • Areas of disturbance will be revegetated at the earliest opportunity.

Potential Interactions with Vegetation	Proposed Mitigative Measures
There is a risk of introducing invasive species through plant matter attached to construction equipment.	<ul style="list-style-type: none"> • Heavy equipment will be properly cleaned and visually inspected prior to mobilizing to site to avoid potential introduction of exotic and invasive species.
Project activities have the potential to impact rare plants from direct disturbance if they are present in the Project site.	<ul style="list-style-type: none"> • Vegetation control measures during the operational phase will be minimized to the extent possible; • Those that are performing onsite activities will be familiarized with the SAR/SOCC identified by the field studies prior to any site activities taking place; • No work in streams which will avoid potential impacts to lichen SAR; • Specimens will be marked with flagging tape and GPS location will be provided to onsite workers to ensure they avoid work in the setback area; • Efforts will be made to maintain mature vegetation along the edges of the development area, particularly in riparian areas; and • During Project activities, should a new SAR/SOCC be identified, a buffer will be maintained and additional mitigation will be developed in consultation with applicable regulatory authorities.

Significance of Residual Effects

The Project will be developed in such a way as to minimize the area of disturbance within the Project site and natural revegetation of the site will be promoted at the earliest opportunity. The majority of the proposed area of disturbance within the Project site is in the regeneration phase due to previous site activities, including agriculture and forestry, which are unrelated to the Project. The final Project layout will take into account appropriate buffers for any identified SAR/SOCC.

Project siting has minimized the flora footprint from the access roads, crane pads, turbine foundation and substation by making use of existing infrastructure and disturbed areas. Land cleared for construction that is not needed for the operational phase of the Project will be restored to the extent possible and is anticipated to naturally regenerate.

Given current knowledge as informed by the desktop assessment, biophysical assessments, and previous site activities, significant potential impacts to vegetation communities are not anticipated as a direct result of the Project with the appropriate implementation of the mitigation measures presented. SAR and SoCC plants were identified in areas of the PDA to be used for the collector network. Any revisions to the project footprint will consider the locations of the SAR and SoCC plants and avoid them to the extent possible by adjusting utility pole alignment to buffer these species, where feasible, or spanning their locations by utility poles and refraining from clearing vegetation in their vicinity.

Additionally, once the decommissioning phase occurs, land reclamation will restore the Project site to its previous state or otherwise based on discussions with landowners. Turbine foundations will be removed

to plough depth. With the proposed mitigation measures employed, the significance of residual effects on flora is predicted to be minor and further monitoring or biophysical assessments are not recommended.

7.2.2 Wildlife

Potential Interactions and Mitigation

In an effort to preserve wildlife habitat and ensure wildlife species remain unharmed, terrestrial wildlife has been identified as a VEC.

The proposed Project is located within an area that has been extensively used for agriculture and forestry practices, and is disturbed by other existing land uses such as the quarry that has proposed a major expansion to the north. The PDA was selected to incorporate agricultural areas and existing roads to minimize (to the extent possible) undisturbed forest habitat. Information collected during field surveys on the presence or potential presence of terrestrial wildlife is presented in **Section 6.2.2**. The encountered wildlife species at the Project site have secure populations in Nova Scotia according to the ACCDC (2021). In addition, and as discussed in **Section 6.2.7**, potential habitat exists within the terrestrial LAA for one SAR species which have been historically observed and recorded within the ACCDC database within 10 km of the PDA (i.e., mainland moose).

Mainland moose have complex spatial and temporal habitat requirements that include a mosaic of woodland and wetland habitat types that provide food, shelter, and appropriate thermal regulatory conditions (NSDNRR 2021). While Westchester is within an area considered to be Core Habitat in the Mainland Moose Recovery Plan (NSDNRR 2021), anthropogenic areas including agricultural fields are not considered part of Core Habitat as they do not meet the diverse biophysical requirements. As the proposed turbines are to be constructed in a primarily agricultural area there is a reduced risk of effects to moose and their habitat.

Additionally, there are other forms of existing disturbance on and adjacent to the Project site, including a quarry that has proposed a major expansion to the north of the site, public roads including highway 104, and telecommunication towers and the associated overhead power lines and access routes.

In order to further mitigate risk to moose during the Project phases, there will be a concerted effort to use existing corridors found on site, to limit over story removal, and vegetation management will not involve the use of glyphosate. Furthermore, the broader threat of climate change will have many negative impacts to Mainland Moose, including exacerbation of parasites and thermal stress. Although the project won't necessarily have measurable climate effects with local impacts on moose, the societal transition to renewable energy is a positive action which may support long term population growth through a reduction in climate change.

In addition to the mitigation methods listed above and in Table 40, the Proponent has contacted the Confederacy of Mainland Mi'kmaq to understand current and proposed Mainland Moose recovery programs. Further discussions are required to understand the scope of work and funding required for such programs, however the Proponent commits to contributing to these programs in order to help the recovery of the Mainland Moose population as they are a species that are of particular significance to

the Mi'kmaq and to the ecosystems within the area. Efforts such as these are important moving forward and lend well to the Mainland Moose Recovery Plan (NSDNRR 2021).

Mainland Moose have the potential to be present within the Terrestrial LAA, as they can reside in a variety of forest habitats. The potential for interactions with Mainland Moose is unlikely within the PDA because moose require an abundance of mature forest for security and thermal cover, (NSDNRR 2021) and the PDA is located mainly within agricultural areas as well as fragmented and previously forested landscape. The potential for a significant environmental effect on Mainland Moose as a result of project activities is considered to be negligible; however, if a moose is observed during any phase of the Project, mitigation measures presented in Table 41 will be followed.

Overall, the Project will decrease some wildlife habitat due to linear infrastructure and crane pads. While the construction and decommissioning phase presents potential for negative impact, impacts are reversible once the decommissioning phase has started and land reclamation activities restore the Project site to its previous state.

The potential interactions of the Project on wildlife and the proposed mitigative measures are summarized in Table 41.

TABLE 41: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR WILDLIFE

Potential Interactions with Wildlife	Proposed Mitigative Measures
<p>Temporary disturbance of foraging fauna and loss of breeding and foraging habitat during Project activities due to increased human presence, noise and Project footprint.</p>	<ul style="list-style-type: none"> • Vegetation will be retained where possible to maintain wildlife habitat; • The Project footprint will be limited to that which is necessary to enable the Project to be carried out; • Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the interactions with wildlife and wildlife habitat; • To minimize wildlife encounters, the site and working areas will be kept clean of food scraps, and garbage will be removed from the site daily and traffic will be limited to roadways; • In the case of wildlife encounters, the following will be implemented: (1) no attempt will be made by any worker at the Project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot; (2) equipment and vehicles will yield the right-of-way to wildlife; and (3) if a SAR or a nest of any bird is encountered during activities, work around the SAR or nest shall cease until a biologist is dispatched to assess the situation and appropriate mitigation is applied; • Participation in or funding to Mi'kmaq run mainland moose recovery programs; • To minimize disruptions with wildlife activity at night, the Project construction activities will be limited to daylight hours when possible; and

Potential Interactions with Wildlife	Proposed Mitigative Measures
	<ul style="list-style-type: none"> • All workers will adhere to the provincial Nova Scotia Endangered Species Act and federal Species at Risk Acts; and • Other mitigative measures in other sections i.e. noise, surface water etc. will also be followed.

Significance of Residual Effects

The effects of the Project activities on wildlife are expected to be limited to the Project footprint that is required to meet Project objectives. Disturbance of fauna habitat as a result of this Project will be minimized through site selection and by employing the proposed mitigation measures. Noise associated with the construction may deter wildlife and potential effects are considered to be short term. With the proposed mitigation, the residual interactions of the Project with fauna species are anticipated to be short in duration and are not anticipated to be substantive because they are limited to the construction and reclamation phases and are occurring already in highly fragmented habitat that has ongoing forestry activities.

The Project's impact on terrestrial wildlife (excluding birds, bats and wood turtles, which are evaluated in the sections below) is predicted to be negligible in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to wildlife populations was a result of project activities.

7.2.3 Wetlands

Potential Interactions and Mitigation

As previously discussed, the proposed Project layout was designed to attempt to minimize interactions with wetlands. The locations of the WTGs are not within 30 m of wetlands; however, there is potential for interactions between wetlands and roads in the Project area. A change in wetland size and/or function could occur during the construction of access roads or site restoration in the areas of the wetlands may require clearing. This could alter the vegetation, increase erosion rates or alter natural drainage patterns in proximity to the aquatic receptors and/or alter the functions of a wetland. Loss of wetland area or function (i.e., hydrological regime, habitat and water quality maintenance) could occur due to clearing of trees and vegetation within the wetlands.

Information gathered on wetlands within the Wetland LAA during the preliminary wetland assessment is outlined in **Section 6.2.3**. During the 2021 field assessments, 17 wetlands (totaling approximately 2.5 ha of land within the PDA) were assessed. These wetlands included treed and shrub swamps with lesser areas of bogs, fens and wet meadows. Of the field-assessed wetlands, only one (i.e., Wetland 14) is anticipated to be directly impacted by proposed access road construction. Although work is proposed within 30 m of their delineated boundaries, the remaining field-delineated wetlands are not anticipated to be directly impacted by road construction and other Project activities.

The current proposed PDA (i.e., the assessment of 16 WTG locations with the intention of developing up to 12 WTG locations) was developed after 2021 growing season. The assessment of wetlands within

areas of the current LAA that were beyond the LAA of the previously proposed Project layout have been assessed via desktop using predictive mapping of potential wet areas. Based on predictive mapping, proposed new access roads are anticipated to directly impact one potentially wet area and come within 30 m of a second potentially wet area. It is estimated that an additional 3 wetlands (approximately 1.72 ha) are potentially within the LAA.

The potential interactions of the Project on wetlands and the proposed mitigation measures are summarized in Table 42.

TABLE 42: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR WETLANDS

Potential Interactions with Wetlands	Proposed Mitigative Measures
<p>During the construction phase, Project activities, such as clearing, grubbing, infilling, and excavation, have the potential to impact wetlands. Such activities have the potential to induce silt run-off, alter flow into the wetlands or see them become repositories of significantly increased water flow, nutrients or sediments.</p> <p>Total loss of wetlands or a portion of wetlands within the footprint of new roads and infrastructure which may impact the interconnectivity of adjacent wetlands within the same watershed.</p>	<ul style="list-style-type: none"> • Avoiding work within 30 m of wetlands to the extent; • Where avoidance is not possible, disturbances will be minimized as much as feasible (i.e., limited to the area which is required to accomplish the Project objectives); • A wetland alteration approval will be applied for and obtained for work in any wetland, noting that work within wetlands will be avoided or minimized to the extent possible during the Project design phase; • Appropriate sediment erosion and run-off control measures (e.g. silt fencing, hay bales) will be implemented following best management practices; • Natural regeneration of the site will be promoted to aid in storm water retention and reduce run-off; • Chemicals and petroleum products will be managed in accordance to manufacturer specifications and stored more than 30 m from a watercourse or wetland; • No stockpiling of materials will occur within 30 m of a wetland; • Vehicle traffic in the wetlands will be minimized by using alternate techniques (e.g. hand cutting vegetation) where possible; • Mats and other means to avoid disruption of the wetlands will be used during necessary tree clearing; • Wetlands within the PDA of collector or transmission lines will be spanned with electrical poles where possible where feasible; • No refueling of equipment will occur within 30 m of a wetland; • Frequent inspection of equipment will ensure fluids do not leak into wetlands; • Spill response kits will be in each piece of equipment; and,

Potential Interactions with Wetlands	Proposed Mitigative Measures
	<ul style="list-style-type: none"> • Proper wetland protection and erosion and sediment control measures following the Environmental Management and Protection Plan (Appendix O) will be installed and checked regularly during the construction phase and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat; and • Avoid work during storm events.

Significance of Residual Effects

The Project will be developed in such a way as to avoid wetlands, minimize disturbance to wetlands where avoidance is not possible, and minimize the area of disturbance within the Project site. Avoidance through site design has been completed to the extent possible, (i.e., avoiding wetlands where possible, spanning wetlands using overhead collection lines, and use of existing roads). In addition, natural revegetation of the site will be promoted at the earliest opportunity. Given current knowledge as informed by the desktop assessment, biophysical assessments, and previous site activities, significant potential impacts to wetlands is not anticipated as a direct result of the Project with the appropriate implementation of the mitigation measures presented. Due to locations of wetlands in proximity to site infrastructure, as well as avoidance of impact to wetlands with infrastructure no further monitoring will be recommended during operations.

7.2.4 Birds and Bird Habitat Potential Interactions and Mitigation

Birds and their habitats have been identified as one of the biophysical VECs. Throughout the construction, operation, and decommissioning of the Project, the potential negative impacts on birds can be classified into four categories: collision, displacement due to disturbance, barrier effects, and habitat loss. The Project's impact on birds, overall, is predicted to be minor in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to migratory and breeding birds was the result of project activities.

During the 2021 bird surveys, over 3400 individual birds of over 80 different species were recorded within the LAA. The bird populations present in the assessment area were observed through the techniques of point counts, area searches/transects, and diurnal watch counts. Information on the existing state of birds and bird habitat based on information gathered and data collected during field surveys, as well as radar and acoustic monitoring is outlined in **Section 6.2.4**. Specifically, three SAR and 14 SoCC birds were observed during the 2021 birds surveys. The SAR birds observed in 2021 within the bird LAA are summarized below, more information on bird SAR and SoCC is further detailed in **Sections 6.2.4 and 6.2.7**.

- Potential breeding Canada Warbler were mainly observed during the spring and summer surveys within the bird LAA. Suitable nesting habitat, such as wet mixed forests with well-developed shrub layers, as well as regenerating areas is widely available within the LAA.
- Common Nighthawks were detected mainly during the summer surveys within the Project site. They typically nest on the ground in open or sparsely vegetated habitats and suitable nesting habitat does exist within the LAA for birds.
- Evening Grosbeaks were identified during the 2021 late-winter, spring summer and fall bird surveys. Suitable breeding habitat for Evening Grosbeaks within the PDA is very limited but exists mainly within the non-forested land within the PDA.

In addition, one bird SAR (i.e., eastern wood-pewee) was detected during the 2012 bird surveys that was not observed during 2021 field surveys. This species breeds in open woodland of all types in Nova Scotia, but shows a preference for forests that are deciduous dominant. The Eastern Wood-Pewee forages on flying insects in the mid-canopy.

During the construction and decommissioning phases interactions are possible as a result of disturbance caused by noise, the loss of habitat within the Project footprint and the temporary disruption of nesting habitat (specifically for common nighthawks). However, the Project layout was designed with specific effort to minimize the disruption to terrestrial habitats and limit construction as much as possible to areas that have been previously been developed or are undergoing regular disturbance due to agricultural practices. In addition, mitigation measures outlined in Table 44 will minimize the disturbance to birds and loss of bird habitat during the construction and decommissioning phases.

During operation there is a possibility that migrating birds could collide with the wind turbines and Project infrastructure. In addition, birds may alter their migration flyways and/or local flight paths to avoid wind turbines. Although the predicted mortality rate of birds due to collision and/or habitat loss cannot be accurately predicted prior to the operational phase, technology and more robust post-construction biophysical assessments have improved understanding of the potential interactions between wind projects and wildlife. Further mitigation measures and monitoring, as outlined in Table 43, will minimize the effects of the project on birds. Should the mitigation be implemented and not be effective, further appropriate actions will be taken in consultation with CWS and NSDNRR.

The data from the radar and acoustic monitoring surveys suggest that during the spring season (and to a lesser extent during the fall) when high migration activity occurred, a subset of those nights showed relatively higher densities of migration within the RSA. However, there were other high-migration nights when the relative density of migration was greater above the RSA.

The potential interactions of the Project with birds and bird habitat and the proposed mitigative measures are summarized in Table 43.

TABLE 43: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR BIRDS AND BIRD HABITAT

Potential Interactions with Birds and Bird Habitat	Proposed Mitigative Measures
<p>During construction vegetation might be cleared and areas disturbed that may be habitat to migratory and breeding birds.</p>	<ul style="list-style-type: none"> • Desktop and field studies conducted suggest a minimal loss of undisturbed bird habitat due to clearing. The clearing footprint is minimized by using existing access roads and areas previously cleared from agricultural and forestry activities; • The Proponent will endeavor to conduct construction activities such as clearing and grubbing during a time period that does not coincide with when migratory and breeding birds would be in the area; • Should clearing and grubbing be required during the region's breeding bird season, the Project area will be visually checked on a daily basis for nesting migratory birds. Should a nesting migratory bird be identified within the work area, ECCC/Canadian Wildlife Service (CWS) will be notified and an appropriate no-work buffer zone (in consultation with ECCC/CWS) will be applied around the nest until the nest has been fledged. No flagging of the nest will occur to minimize chances of predation; • Workers will be familiarized with the SAR and SOCC that were identified at the site during the biophysical assessments prior to work commencing; • Stockpiling of fill and excavated materials will be minimized to deter the potential for nesting by bank swallows or other ground nesting species (e.g., common nighthawk). Fill/excavation material piles will be at low angles, if left standing for long durations; • All workers will adhere to the Migratory Birds Convention Act, 1994 and the Migratory Birds Regulations; and • All workers will adhere to the provincial Nova Scotia Endangered Species Act and federal Species at Risk Acts.
<p>Construction lighting may alter the behavior of birds.</p>	<ul style="list-style-type: none"> • To minimize disruptions with wildlife activity at night, the Project construction activities will be limited to daylight hours when possible; • Necessary construction lighting will be pointed downwards; and, • Instruction will be given to maintenance staff to ensure all work lights are turned off upon leaving the site particularly during foul weather events.
<p>During operation there is a possibility that migrating birds could collide with the wind turbines and Project infrastructure.</p>	<ul style="list-style-type: none"> • A follow up avian mortality survey will be planned and conducted in consultation with NR&R and CWS after the Project commissioning; • During the first year, post construction monitoring events will be targeted to capture the morning following nights with favorable tail wind conditions;

Potential Interactions with Birds and Bird Habitat	Proposed Mitigative Measures
	<ul style="list-style-type: none"> • Should unexpected negative impact to migration flyways occur, appropriate actions will be taken in consultation with CWS and NR&R; • Non-operational towers shall be dismantled if not expected to be put back into operation; and • A comprehensive Adaptive Management Plan will be developed and implemented in consultation with CWS and NR&R.
<p>Birds may alter their migration flyways and/or local flight paths to avoid wind turbines.</p>	<ul style="list-style-type: none"> • A follow up avian mortality survey will be conducted after the Project commissioning and appropriate actions will be taken in consultation with CWS and NR&R.
<p>Lighting on turbines can result in adverse impacts on birds. The Proponent recognizes that nocturnal migrant and night-flying seabirds are the birds most at risk of attraction to lights.</p>	<ul style="list-style-type: none"> • Lighting requirements will meet ECCC standards to minimize the potential impacts to migratory birds; • Only the minimum amount of pilot warning and obstruction avoidance lighting will be used; • Only lights with short flash durations and the ability to emit no light during the 'off phase' of the flash (i.e. as allowed by strobes and modern LED lights) will be installed on tall structures; • Lights will operate at the minimum intensity and minimum number of flashes per minute (longest duration between flashes) allowable by Transport Canada; • Instruction will be given to wind farm maintenance staff to ensure all work lights are turned off upon leaving the site particularly during foul weather events; and • A follow up avian mortality survey will be conducted after the wind farm commissioning, and appropriate actions will be taken in consultation with CWS and NR&R.
<p>Fog events can impair avian visibility, increasing the likelihood of mortality from collision with wind turbines.</p>	<ul style="list-style-type: none"> • Instructions will be given to wind farm maintenance staff to ensure all work lights are turned off upon leaving the site particularly during foul weather events.

Significance of Residual Effects

The predicted mortality rate of birds due to collision and/or habitat loss cannot be accurately predicted prior to the operation of the Project as there is little correlation between pre-construction activity levels and operational mortality, however, it is anticipated that the mortality rate of birds from collision or habitat loss during Project operation, if at all, will be low. Mabee et al. (2006) reported that migration altitudes averaged 410 m a.g.l within the ground to 1.5 km altitude range, and nightly averages ranged from 214 to 769 m. It is important to note that the percent of targets detected in that study was relatively uniform between 0 and 500 m a.g.l., which would indicate that there isn't a greater risk of avian collision if turbine heights were increased to 200 m.

Horton et al. (2016) indicates average heights of bird flight paths during migration recorded from multiple studies ranged between 119.8 m and 1135.6 m. As these are averages, night migrants were found both above and below these levels suggesting current wind energy facilities are already within this migration corridor and thus, using turbines with a maximum height range of 200 m does not pose a new risk. Erickson et al. (2014) indicated that bird mortality at wind energy facilities in North America account for at most 0.043 % of the population estimates for the species most affected by collision mortality; turbine collision mortality accounted for a lower rate than this for all other species and does not pose a threat to populations.

Impacts to avian nocturnal migration will be minimized by employing the proposed mitigation measures. The predicted mortality rate of birds due to collision cannot be accurately predicted at the time of EA registration as there is little correlation between pre-construction activity levels and operational mortality. The Proponent is committed to developing an adaptive management plan that will include a monitoring plan for bird and bat mortality during operation. Therefore, with proposed mitigation, the residual interactions of the Project with nocturnal migrating birds are not anticipated to be substantive. Should post-construction mortality monitoring surveys not reflect this prediction, the proponent will engage regulatory authorities in an adaptive management framework and work collaboratively with those agencies to utilize the best practices available at that time to reduce impacts in a fashion that addresses the site-specific findings from the monitoring program.

The Proponent does not anticipate significant mortality rates for the proposed turbines at a maximum height of 200 m. The Proponent is committed to developing an adaptive management plan that will include a monitoring plan for bird mortality during operation. The recommended post-construction monitoring for bird mortality during operation will verify the impact the Project has on migratory and breeding birds. With the proposed mitigation measures employed, the significance of residual effects on migratory and breeding birds is predicted to be minor and limited to the Project site. Should the post-construction surveys indicate something different, the Proponent will follow the Adaptive Management Plan and engage regulatory authorities in applying additional mitigative measures.

7.2.5 Bats and Bat Habitat Potential Interactions and Mitigation

Bats have been identified as one of the biophysical VECs because of the potential impacts on bats that the Project can have during all phases of the Project. The potential impacts on bats can be classified into two categories: collision and habitat disturbance.

The predicted mortality rate of bats due to collision and/or habitat loss cannot be accurately predicted at the time of EA registration as there is little correlation between pre-construction activity levels and operational mortality. However, industry standards, technology and more robust biophysical assessments have improved understanding of the potential interactions between wind projects and wildlife.

Bat activity was surveyed in the field using acoustic bat monitors, as discussed above in **Section 6.2.5**. The average total bat passes and migratory bat passes per detector night for the breeding period

spanning June 1 through July 31 and a fall migration period of August 1 through October 15, equates to 0.08 to 0.06 bat passes, and 0.26 to 0.05 bat passes, respectively. Based on Dillon’s experience on similar bat acoustic programs throughout the country, both the total number of bat passes and the average bat passes per detector night (during the breeding period, fall migration, and entire survey period) are considered very low.

The potential interactions between bats and bat habitat with the project include the loss of habitat, or displacement from surrounding habitat, due to construction activities; fatalities due to collisions with turbine towers or blades or the transmission line infrastructure during operation; and modifications to existing flight paths as bats avoid the project area or are attracted to the area by tower lights. The potential interactions of the Project on bats and bat habitat and the proposed mitigative measures are summarized in Table 44.

TABLE 44: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR BATS AND BAT HABITAT

Potential Interactions with Bats and Bat Habitat	Proposed Mitigative Measures
Clearing and construction activities have the potential to cause disturbance to bat habitat.	<ul style="list-style-type: none"> The Project site has been designed to minimize the amount of land cleared. This reduces the ecological impact of the Project Footprint and minimizes the potential impact to bat habitat; and, The area of disturbance will be vegetated as soon as feasible.
During operation there is a possibility that bats could collide with the wind turbines or succumb to barotrauma.	<ul style="list-style-type: none"> A follow up bat mortality survey will be conducted after the Project commissioning and appropriate actions will be taken in consultation with the appropriate authorities should there be a significant negative impact to bats; Non-operational towers shall be dismantled if not expected to be put back into operation; and A comprehensive Adaptive Management Plan will be developed and implemented in consultation with CWS and NR&R.

Significance of Residual Effects

Disturbance of bat habitat during construction has the potential to occur, however due to the low number of bat passes recorded at the Project site, limited predicted impacts to the habitat, and with the implementation of planned mitigation and careful development and implementation of contingency and emergency response plans, it is anticipated that effects related to the Project will not be substantive. Should follow up surveys indicate something different, the Proponent will engage regulatory authorities in applying additional mitigative measures.

Post-construction monitoring for bat mortality during operation will also verify the effect the Project has on bats. Should a significant amount of bat mortality be observed following the post construction surveys, the Proponent will follow the Adaptive Management Plan and engage regulatory authorities in applying additional mitigative measures.

7.2.6 Aquatic Environment

7.2.6.1 Fish and Fish Habitat

Potential Interactions and Mitigation

The PDA was selected to minimize interactions with watercourse crossings by avoiding development in locations with watercourses to the extent possible. As a result of careful Project planning, the locations of the WTGs are not within 30 m of watercourses, however, 30 watercourse locations were identified within 50 m of existing forestry roads to be upgraded or proposed new access roads, including 10 that are considered fish-bearing or likely to be fish-bearing. The majority of watercourses within the LAA occur along the proposed collector network, which will span watercourses with overhead lines and poles, avoiding the need for new crossing construction. Based on desktop and field assessments, the new proposed roads in PDA are anticipated to cross existing watercourses at seven locations.

The proposed layout utilizes existing road infrastructure where possible to minimize disturbance of the local environment. As such, the proposed WTG locations were selected to avoid encroachment of watercourses and are not within 30 meters of a watercourse.

Potential temporary interactions with fish and fish habitat may occur from physical alterations of the aquatic environment (i.e. watercourse crossings) during the construction and decommissioning phase. Interaction may primarily occur during clearing and grubbing and access road widening, as well as during eventual infrastructure removal and site reclamation activities in the decommissioning phase. Potential interactions include increasing sediment load during earth works from altering surface water drainage patterns.

The potential interactions of the Project on fish and fish habitat and the proposed mitigative measures are summarized in Table 45.

TABLE 45. POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR FISH AND FISH HABITAT

Potential Interactions with Fish and Fish Habitat	Proposed Mitigative Measures
Loss or damage to fish and fish habitat during clearing and grubbing and access road widening, as well as during eventual infrastructure removal and site reclamation activities in the decommissioning phase.	<ul style="list-style-type: none">• Limit the removal of riparian zone vegetation;• Minimize the use of heavy equipment within 30 m of a watercourse to the extent possible;• Construction activities near watercourses will comply with the applicable regulations and guidelines such as the Fisheries Act and will be carried out strictly in accordance with NSECC and DFO Approvals, Terms and Conditions, and Letters of Advice;• Where possible, watercourse crossings will be located in areas that exhibit a stable soil type where grades approaching the crossings will not be too steep, and will span the watercourse where possible;• Proper erosion and sediment control measures will be installed and checked regularly during the

Potential Interactions with Fish and Fish Habitat	Proposed Mitigative Measures
	<p>construction phase and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat;</p> <ul style="list-style-type: none"> • Sufficient staff and equipment to manage erosion and sediment control during storm events and other emergencies will be provided; • In stream work will be timed to occur in the dry season and not during significant rainfall. Culverts will be designed and installed to prevent the creation of barriers to fish movement and maintain bankfull channel functions and habitat functions to the extent possible; • Prior to in-stream work, fish-outs will be completed to ensure no harm to resident fish species. Captured fish will be released outside of the work area; • Runoff will be controlled, and sediment will be prevented from leaving the Site at all times; and • Visual monitoring of silt or sedimentation within watercourses will occur during construction after heavy weather events; and • No equipment stored within 30 m of water course, fuel and chemicals will be properly stored.

Significance of Residual Effects

Interactions between the Project and the aquatic environment are expected to construction and decommissioning activities may require the installation of watercourse crossings or widening of existing crossings which could impact fish and their ability to use and/or access upstream habitat. Sediment laden runoff from grubbed and cleared areas, or stockpiled soil, within the PDA can harm fish and damage their habitat by entering watercourses that flow through the Project site. By limiting the timing of soil disturbance activities to avoid high precipitation events, working within the dry season, installing sediment control measures, and following all other applicable best practices (outlined in Appendix O), these interactions are anticipated to be limited in location and duration and controlled. With the implementation of these mitigation measures, interactions between the Project and the fish and fish habitat are not anticipated to be substantive and no follow-up or monitoring is recommended unless required under permit from NSECC or DFO.

7.2.6.2 Turtle and Turtle Habitat Potential Interactions and Mitigation

Surveys for turtles and their habitat were included in the aquatic habitat assessments at behest of NSDNRR due to the proximity of the proposed Project to Critical Habitat for the wood turtle. The West Branch of the Wallace River, beginning approximately 3 km from the nearest proposed WTG location is considered Critical Habitat for wood turtle. Though a part of the PDA (an existing road) crosses through

the Wallace River secondary watershed, the watercourses within the watershed are not anticipated to be effected given that they do not intersect the existing road. Although targeted surveys were undertaken and no turtles or preferable habitat were identified during the 2021 field surveys there is the potential for turtles to be incidentally present on the site

The proposed Project is located within an area that has been used for agricultural and forestry practices. The PDA was selected to incorporate previously disturbed habitat such as clear cuts and agricultural land and minimize the potential impact on undisturbed areas as much as feasible.

Potential interactions with turtles during the construction and decommissioning Project phases are possible and include temporary disturbance of foraging fauna and loss of breeding and foraging habitat during Project activities due to increased human presence, noise and Project footprint. These, along with proposed mitigation measures are presented in Table 46.

TABLE 46. POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR TURTLES AND TURTLE HABITAT

Potential Interactions with Wildlife	Proposed Mitigative Measures
<p>Temporary disturbance of foraging fauna and loss of breeding and foraging habitat during Project activities due to increased human presence, noise and Project footprint.</p>	<ul style="list-style-type: none"> • Vegetation will be retained where possible to maintain wildlife habitat; • The Project footprint will be limited to that which is necessary to enable the Project to be carried out; • Existing roads and trails will be utilized to the extent possible to limit disturbance outside the Project footprint and minimize the interactions with turtles and turtle habitat; • Erosion and sediment control measures will be installed and checked regularly during the construction phase and prior to, and after, storm events to confirm they are continuing to operate properly to minimize potential effects to adjacent habitat; • To minimize encounters, the site and working areas will be kept clean of food scraps, and garbage will be removed from the site daily and traffic will be limited to roadways; • Areas of higher potential for turtle encounters will be surveyed daily for signs of turtle nesting or digging prior to construction; • Onsite workers will be familiarized with the potential types of turtles in the area and what signs of nesting or foraging could look like prior to commencing onsite work • In the case of turtle encounters, the following will be implemented: (1) no attempt will be made by any worker at the Project site to chase, catch, divert, follow or otherwise harass turtles by vehicle or on foot; (2) equipment and vehicles will yield the right-of-way to turtles; and (3) if a SAR or a nest is encountered during activities, work around the SAR

Potential Interactions with Wildlife	Proposed Mitigative Measures
	<p>or nest shall cease and exclusion fencing will be applied until a biologist is dispatched to assess the situation and appropriate mitigation is applied;</p> <ul style="list-style-type: none"> • Installing sediment control measures; • To minimize disruptions with turtle activity at night, the Project construction activities will be limited to daylight hours when possible; and • All workers will adhere to the provincial Nova Scotia Endangered Species Act and federal Species at Risk Acts.

Significance of Residual Effects

As previously discussed, the proposed Project layout was designed to minimize interactions with wetlands and water bodies. The effects of the Project activities on turtles are expected to be limited to the approximate Project footprint that is required to meet Project objectives. Disturbance of habitat as a result of this Project will be minimized by employing the proposed mitigation measures. With the proposed mitigation, the potential for residual interactions of the Project with turtles are anticipated to be short in duration and are not anticipated to be substantive because they are limited to the construction and reclamation phases. The potential for a significant environmental effect on turtles as a result of project activities is considered to be negligible following the mitigation measures presented above, along with mitigations measures to protect wetland and aquatic habitat (presented in **Section 7.2.3**). The locations of the WTGs are not within 30 m of wetlands or waterbodies, therefore, potential project impacts during the operational phase of the Project is considered to be minimal.

The Project's impact on turtles and turtle habitat is predicted to be negligible in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to turtle populations was a result of project activities.

The mitigation measures, outlined in Table 45 and Table 46, will minimize the potential for runoff from the Project areas to reach aquatic habitats.

7.2.7 Species at Risk Potential Interactions and Mitigation

The proposed Project is located in a primarily agricultural and forested area that has the potential to provide habitat for some SAR and SoCC. The Proponent is committed to protecting SAR, SoCC and their habitat as important features and VECs related to the proposed Project. A significant effect is considered to include the loss of SAR, SoCC and their habitats. SAR and SoCC either confirmed or that have the potential to be present within the PDA are listed in **Section 6.2.7**. Potential interactions and proposed mitigation measures for SAR and SoCC are dependent on the type of flora or fauna encountered and are discussed in the following sections:

- **Section 7.2.1:** Potential interactions and proposed mitigation measures for plant SAR and SoCC;

- **Section 7.2.2:** Potential interactions and proposed mitigation measures for terrestrial wildlife (excluding birds and bats) SAR and SoCC;
- **Section 7.2.4:** Potential interactions and proposed mitigation measures for bird SAR and SoCC
- **Section 7.2.5:** Potential interactions and proposed mitigation measures for bat SAR and SoCC
- **Section 7.2.6:** Potential interactions and proposed mitigation measures for fish and aquatic turtle SAR and SoCC

Mainland moose were identified by ACCDC within 7.3 km of the site (ACCDC 2021). While Westchester is within an area considered to be Core Habitat in the Mainland Moose Recovery Plan (NSDNRR 2021), anthropogenic areas including agricultural fields are not considered part of Core Habitat as they do not meet the diverse biophysical requirements. As the proposed turbines are to be constructed in a primarily agricultural area there is a reduced risk of effects to moose and their habitat. During the field survey in 2021, no moose or signs of moose were observed; however, during the previous studies completed at this site in 2012, there were moose tracks found during moose transect surveys.

In addition to the mitigation methods listed in Table 47, the Proponent has contacted the Confederacy of Mainland Mi'kmaq to understand current and proposed Mainland Moose recovery programs. Further discussions are required to understand the scope of work and funding required for such programs, however the Proponent commits to contributing to these programs in order to help the recovery of the Mainland Moose population as they are a species that are of particular significance to the Mi'kmaq and to the ecosystems within the area. Efforts such as these are important moving forward and lend well to the Mainland Moose Recovery Plan (NSDNRR 2021).

The Project layout was designed to avoid plant and lichen SAR and additional mitigation protecting other VECs would also protect SAR.

The protection of avian SAR and SOC through minimizing/not clearing during breeding season and if required, conducting nesting season is part of the EMP (Appendix O).

The potential interactions of the Project on species at risk and the proposed mitigative measures are summarized in Table 47.

TABLE 47: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR SPECIES AT RISK

Potential Interactions with Species at Risk	Proposed Mitigative Measures
<p>Project activities have the potential to impact SAR from direct disturbance if they are present in the Project site.</p>	<ul style="list-style-type: none"> • During Project activities, should a SAR/SOCC be identified, a buffer will be maintained and additional mitigation will be developed in consultation with applicable regulatory authorities specific to the SAR/SOCC species identified; • about people working the site will be informed of known/suspected SAR SOCC and will be familiar with their appearances prior to starting work • and • Wildlife protection measures following the Environmental Management and Protection Plan (Appendix O) will be instated.

Significance of Residual Effects

The effects of the Project activities on species at risk are expected to be limited to the Project footprint that is required to meet Project objectives. Disturbance of species at risk and their potential habitat as a result of this Project will be avoided or minimized by employing the proposed mitigation measures. With the proposed mitigation, the residual interactions of the Project with species at risk are anticipated to be short in duration and are not anticipated to be substantive because they are limited to the construction and reclamation phases.

Residual effects of the Project during the operational phase are possible for bird and bat species at risk, especially migratory species. The Proponent does not anticipate significant mortality rates for the proposed turbines at a maximum height of 200 m. The recommended post-construction monitoring for bird and bat mortality during operation will verify the impact the Project has on these species. With the proposed mitigation measures employed, the significance of residual effects on bird and bat SAR is predicted to be minor. Should the post-construction surveys indicate otherwise, the Proponent will follow the Adaptive Management Plan and engage regulatory authorities in applying additional mitigative measures.

7.3 Socioeconomic VEC

7.3.1 Economy

Potential Interactions and Mitigation

The Project is expected to provide jobs through construction contracts, for which the Proponent aims to hire locally when feasible. In addition, the project is not anticipated to impact the current property operations (i.e., agricultural, forestry, tourism, etc.) that already contribute to the economy. The Project will also lead to economic spinoff during construction through the use of local accommodations and services during onsite work. This is expected to be economically beneficial for the area. Additionally, the Project will produce economic benefits to the municipality through the payment of property taxes. The

installation of the Project may also provide tourism benefits for the area as people may come to view the Project.

As the Proponent is committed to utilizing the local labor force where possible, the Project is not anticipated to add strain to the community services already in place.

The potential interactions of the Project on the economy and the proposed mitigative measures are summarized in Table 48.

TABLE 48: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR THE ECONOMY

Potential Interactions with the Economy	Proposed Mitigative Measures
<p>The Project will provide employment opportunities to the local community during construction, operation, and decommissioning phases.</p>	<ul style="list-style-type: none"> • Where possible the local workforce will be sourced to fill the employment opportunities; and • Where possible services and accommodations will be sourced from the local community • Community economic development is a positive impact: no mitigation is required. • The proposed Project will support community economic development through hiring local consultants and contractors, when possible, the use of local services such as accommodations, restaurants and fuels, and will be required to pay municipal taxes; and • The proposed Project will support a stable long term revenue source to the 13 Mi'kmaq bands in Nova Scotia.
<p>The Project will provide economic development opportunities for the Mi'kmaq, local communities, Municipality of Cumberland, and Nova Scotia.</p>	

Significance of Residual Effects

The Proponent will, when appropriate, make every reasonable effort to utilize local services and products, which is in line with the Proponents' ideology of community-based projects. The predicted effects of this Project on the local economy are positive and as a result of the employment opportunities, municipal taxes and economic spinoff, the significance of residual effects on local economy is expected to be beneficial.

7.3.2 Land Use and Values Potential Interactions and Mitigation

The Project is located in a fairly remote area of the Municipality of Cumberland on privately-owned land. The private lands are currently used for agriculture and forestry and the area is, therefore, considered to be an ecologically disturbed area with a network of existing access roads. The land is currently used for some recreational purposes, such as snowmobiling. A wind project is considered a compatible use for these existing land uses as the current uses will be able to continue following the construction of this project.

A review of the available literature found that there were no correlating negative associations between wind farms and property value. In 2010 a study in the Municipality of Chatham-Kent, Ontario was

prepared to assess the effects of wind energy on real estate values. This report was prepared in accordance with the Canadian *Uniform Standards of Professional Appraisal Practice* for the Appraisal Institute of Canada (Canning et al. 2010). The report is widely recognized in the wind industry as a thorough study and demonstrates what many other studies also indicate. The study found that it was highly unlikely that a relationship exists between wind farms and the market values of rural residential real estate (Canning et. al. 2010).

A study by the University of Guelph analyzed more than 7,000 home and farm sales that occurred between 2002 and 2010 in Melancthon Township, Ontario, which saw 133 turbines erected between 2005 and 2008. Of the 7,000 homes and farms, 1,000 were sold once, and some multiple times. Co-authors, Richard Vyn and Ryan McCullough conclude that the turbines in question have not impacted the value of the surrounding properties. Further, the nature of the results, which indicate a lack of significant effect, is similar across both rural residential properties and farm properties (Vyn McCullough 2014).

There is the potential that the turbine rotor may interfere with the transmission and receipt of telecommunication signals from radiocommunication towers. A Radiocommunication Impact Study has been completed to locate the communication towers in the area and assess the potential for the Project to impact them. Appropriate buffers have been applied to all radiocommunication towers and their signal corridors according to the Radio Advisory Board of Canada (RABC) guidelines, and consultation with service providers has been carried out.

Though two of the proposed turbine locations are sited within the consultation zones outlined by the Radio Advisory Board of Canada and the Canadian Wind Energy Association (RABC-CanWEA) (2020), consultation with the service providers has concluded that there is no anticipated interference to the existing radiocommunication infrastructure and systems as a result of the Project. Consultation with these service providers will continue. The Radiocommunications System Impact Study in Appendix M demonstrates this conclusion.

Transport Canada and Navigation Canada have been consulted in regards to the Project. Aeronautical Obstruction Evaluations and Land Use Proposal Forms have been submitted for evaluation of the proposed Project location and have received approval. The Department of National Defence has also been notified of the proposed project and location and a letter of non-objection has been received.

The potential interactions of the Project on land use and values and the proposed mitigative measures are summarized in Table 49.

TABLE 49: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR LAND USE AND VALUES

Potential Interactions with Land Use and Values	Proposed Mitigative Measures
Wind turbine operation may interfere with telecommunication and/or radar communication infrastructure	<ul style="list-style-type: none"> • Consultation was completed as recommended by the CarWEA and RABC’s guidance document – Technical Information and Guidelines on the Assessment of the Potential Impact of Wind Turbines, on Radio Communications, Radar and Seismoacoustic Systems; • A desktop radiocommunication impact assessment was conducted by the Proponent in line with the RABC guidelines. The results of the assessment show that the turbine locations will not interfere with the telecommunication corridors of nearby towers; • Approval has been received from Navigation Canada, ensuring that the Project does not pose any hazard to the navigational systems; and • Transport Canada and Department of National Defense have also approved the Project location.
Current land use may be impacted during the construction and operation of the Project.	<ul style="list-style-type: none"> • Consultation with all current land users is ongoing; • Ongoing consultation with the local snowmobile club has and will continue to occur to ensure safe recreational use of the Project lands; • When agricultural and forestry activities are occurring onsite, extra caution will be taken on roads; and • The zoning for the Project is appropriate with surrounding land uses, so incompatible land uses are not expected to occur.
Public concern that property value may decrease as a result of the Project	<ul style="list-style-type: none"> • Real estate value studies have consistently determined no correlation between proximity to wind farms and property devaluation (Canning et al. 2010); and • Education through public consultation can be effective in providing factual, relevant information to alleviate the concerns of local residents.

Significance of Residual Effects

Based on consultation with the appropriate authorities, no impedance on communication infrastructure is to be expected. As a result, the significance of residual effects on telecommunication and radar communication is expected to be limited to negligible.

The current land use will not be significantly changed by the addition of the Project infrastructure to the existing lands with careful planning and consultation with landowners, as well as the mitigation measures in Table 49. Consultation with direct and adjacent land users will continue on an ongoing basis to confirm safe and compatible use on the Project site. Property values are not anticipated to decrease as a result of the project based on available real estate value studies reviewed and continued education through public consultation.

The significance of residual effects on land use and property value is expected to be negligible.

7.3.3 Transportation Potential Interactions and Mitigation

During construction of the access roads and turbine foundations, there will be an increase in truck traffic on the roads leading to and from the Project site. During delivery of the turbine components, delivery of oversized loads may slow traffic flow for limited periods of time.

Oversized loads will be associated with the delivery of turbine towers, blades, nacelles, and the cranes required for erection and decommissioning. These deliveries are anticipated to be subject to movement orders as agreed upon with governing authorities.

The potential interactions of the Project on transportation and the proposed mitigative measures are summarized in Table 50.

TABLE 50: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR TRANSPORTATION

Potential Interactions with Transportation	Proposed Mitigative Measures
Temporary traffic delays are possible during construction due to movement of equipment and materials to the Project site.	<ul style="list-style-type: none"> • Detour and other traffic control signs will be posted where necessary during construction to minimize traffic within the construction site; • Delivery of materials to site will be scheduled outside of peak traffic times, when possible; • Truck drivers will adhere to posted speed limits and warning signage and adjust driving to meet weather and road conditions; • All necessary permits will be obtained and industry best practices will be followed for special moves or traffic interruptions on public roads; • Any potential modifications to intersections for access to the Project Area will follow appropriate traffic controls and permitting; and • The construction schedule will be shared with nearby residents.

Significance of Residual Effects

The time frame in which an impact to traffic may occur will be localized and of short duration, and combined with the proposed mitigative measure of avoiding high traffic times; the significance of residual effects on vehicular traffic is expected to be negligible. No further studies or monitoring is recommended.

7.3.4 Human Health and Safety

Public health and safety are of great importance in the development of the Project. During all Project phases, the protection of worker and the public health and safety is protected under the provincial OHS (*Occupational Health and Safety*) Act.

Proper setbacks have reduced the risk to public health and safety from noise and shadow flicker impact, possible fires, ice throw and malfunction. Technological considerations, including a built-in system to

detect ice on the blades, to reduced ice throw will be implemented. Further, a lightning protection system will conduct electrical surges away from the nacelle to prevent fires. This system includes wiring around and throughout the turbine to transport and dissipate the surge to the ground.

Consultation with applicable aviation authorities has occurred, and the turbine lighting will conform to Transport Canada requirements for aviation safety. Safe work practices will be encouraged onsite during the construction phase.

Over the past few years, there has been growing concern over public safety in relation to possible exposure to electromagnetic fields (EMFs) from wind turbines. Electric fields are generated by a difference in voltage while magnetic fields are generated when there is a flow of electric current. A higher voltage and greater the current will result in a larger EMFs (WHO 2017).

EMFs can also occur naturally in the environment and are generated from every electrical distribution line that connects to homes and from all household electronic devices. A study conducted in 2014 (McCallum et al.) found that EMFs around wind turbines do not present a health concern to the public and that levels surrounding wind turbines are found to be lower than levels found around homes from use of common household electrical devices.

EMFs generated from wind turbines are not considered to pose health concerns and are not considered a potential impact to public health and safety.

Ice accumulation on wind turbine blades can occur during the winter months when the appropriate conditions of temperature and humidity exist, or during certain extreme weather conditions, such as freezing rain (Seifert et al. 2003). In the event that ice builds up on the wind turbine blades, there are two types of risks possible: the first is ice throw from an operating wind turbine, and the second is ice fall from a wind turbine that is not in operation.

Ice throw was investigated to determine the risk probability for an individual to be struck by ice thrown from an operating wind turbine. The results of the statistical analysis by (LeBlanc et al. 2007), as discussed further in Section 8.3, found that individual risk probability for an individual is incredibly low.

Effects to human health and safety as a result of an interaction with the proposed Project are only anticipated to occur as a result of an accident, malfunction or unplanned event. The potential interactions of the Project on human health and the proposed mitigative measures are summarized in Table 51.

TABLE 51: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR HUMAN HEALTH.

Potential Interactions with Human Health	Proposed Mitigative Measures
During cold weather there is the potential for ice to build up on the turbine blades and be thrown.	<ul style="list-style-type: none"> • Turbines will be equipped with ice-detection systems on each blade; • Turbines will be designed to shut down in the case of ice-buildup and/or activate the de-icing system, if available; and • Signage will be posted on site to indicate the risk of ice throw to any land users and to require Personal Protection Equipment to be worn when near the turbines; and • Ongoing communication with land owners should the risk become heightened for any reason (i.e. weather).
During extreme weather events, there is the potential for electrical fires within the turbine nacelle through lightning strikes.	<ul style="list-style-type: none"> • Turbines will be equipped with lightning protection that, in the unlikely event of a lightning strike, will dissipate the lightning current to the ground.
Potential aviation hazard to low flying aircraft.	<ul style="list-style-type: none"> • Approval has been received from Navigation Canada and Transport Canada for the turbine locations, ensuring that the Project does not pose any hazard to the navigational systems; and • Approved lighting systems will be installed on the WTGs.
Increase in vehicular traffic may have the potential to affect public safety.	<ul style="list-style-type: none"> • Every reasonable effort will be made to ensure that oversized loads are delivered during times of lowest traffic to mitigate road traffic; • Speed limit signs will be posted across the site and roads onsite will be maintained in good working order.
Shadow flicker may affect human health.	<ul style="list-style-type: none"> • This potential impact has been addressed in the Shadow Flicker Section 7.1.3.
Sound levels may affect human health.	<ul style="list-style-type: none"> • This potential impact has been addressed in Section 7.1.1.
Potential for accidents and malfunctions pose a risk to workers and the public's health and safety.	<ul style="list-style-type: none"> • The OHS Act will be followed.

Significance of Residual Effects

The development of the Project has the potential to interact with human health through temporary disturbance such as increases to traffic. However, the construction phase of the Project will be temporary and the ongoing operation of the Project is expected to result in minimal to no disruptions. Furthermore, the Project will provide a clean and renewable source of electricity generation that will ultimately help to mitigate climate change and reduce the amount of greenhouse gas emissions, which are positive environmental interactions. Therefore, with proposed mitigation, the residual interactions of the Project with human health are not expected to be substantive.

Throughout Project planning and design, the top priority has been health and safety. This is to make every reasonable effort to eliminate any negative potential impacts the Project may have on public

health and safety. By following the proposed mitigative measures as well as regulatory guidelines pertaining to health and safety, the significance of residual effects on health and safety is expected to be negligible. Cultural and Heritage VECs

7.3.5 Archaeological and Cultural Resources

Potential Interactions and Mitigation

The Project also has the potential to interact with heritage resources via accidental discovery of archaeological or cultural resources during excavation activities. Without mitigation, environmental effects include the potential permanent destruction of any previously undiscovered archaeological or palaeontological resources that might be present within the Project areas. Three archaeological findings were identified within the Project area (two along proposed linear infrastructure) by archaeologists during the field reconnaissance portion of the Archaeological Resources Impact Assessment (ARIA) completed by CRM Group in 2021 (see **Section 6.4** and Appendix N). Based on these results, the CRM Group offered the following recommendations:

The potential interactions of the Project on archaeological and cultural resources and the proposed mitigation are summarized in Table 52.

TABLE 52: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR ARCHAEOLOGICAL AND CULTURAL RESOURCES.

Potential Interactions with Archaeological and Cultural Resources	Proposed Mitigative Measures
Direct impact to cultural resources during construction activities, such as blasting and excavation.	<ul style="list-style-type: none"> • Educate site workers on the high potential for archaeological resources in the area, what to look for and proper processes for anything found; • A 50 m buffer will be placed around known archaeological sites in the Project area; • Avoidance is the preferred method of mitigation in all instances where archaeological resources are present; • If archaeological resources cannot be avoided, an additional archaeological assessment within the 50 metre buffers, including intensified archaeological screening, shovel test pitting, and feature documentation will be completed by an archaeologist; • An archaeologist will perform a walk over assessment of any areas not previously assessed prior to any earth disturbing activities; • Ground intrusive work activities will not exceed the predefined Project areas; • Construction workers working within 80 m of a watercourse will be advised of the higher potential for archaeological resources;

Potential Interactions with Archaeological and Cultural Resources	Proposed Mitigative Measures
	<ul style="list-style-type: none"> • Contingency and emergency response procedures will be developed and implemented; • Should archeological resources be encountered by chance during construction, all work in the area will cease immediately and the Archaeology and Heritage Branch of Nova Scotia Communities, Culture, Tourism and Heritage will be contacted at (902) 424-6475 for further mitigation; • Until a qualified archaeologist arrives at the scene, no one shall disturb, move or re-bury any uncovered artifact; • Activities at the site may resume only when authorized by Archaeological Services and once mitigation measures have been completed; • If bones or human remains are found, work in the area must cease, and the RCMP shall be immediately notified; • No one shall disturb, move or rebury any uncovered human remains; • If the discovered resources are related to Indigenous culture, the Nova Scotia Office of L'nu Affairs will be contacted to determine how best to proceed with respect to repatriation of the resources; and • The Nova Scotia Museum of Natural History will be notified at (902) 424-7353, should fossils be encountered during the ground intrusive work.

Significance of Residual Effects

There is potential to encounter previously unidentified heritage resources during the construction phase of the Project, due to the high level of heritage resources already discovered in the immediate vicinity, and the land history of the site area (**Section 6.4**). Potential interactions are anticipated to be limited to the construction phase and are not anticipated to occur during the operation and maintenance or reclamation phase. Based on these results, it is imperative that site workers are aware of the archaeological potential of the area, and to follow the appropriate pathways if additional archaeological resources are found during Project work.

7.4 Assessment of Potential Project Interactions with the Environment as a Result of Accidents, Malfunctions, and Unplanned Events

Potential Interactions and Mitigation

There is a potential for accidents, malfunctions, or unplanned events related to any project, particularly during the construction and decommissioning phases. Without proper mitigation, the Project could interact with many of the VECs as a result of accidents, malfunctions, or unplanned events associated with the Project activities. To limit accidents, malfunctions, and unplanned events during the Project, mitigation measures will be followed.

The potential interactions of the Project with VECs as a result of accidents, malfunctions, and unplanned events and the proposed mitigative measures are summarized in Table 53.

TABLE 53: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR UNPLANNED EVENTS, MALFUNCTIONS AND ACCIDENTS

Potential Interactions due to Unplanned Events, Malfunctions and Accidents	Proposed Mitigative Measures
<p>The accidental release of a hazardous materials through spills and vehicle traffic could affect soil, groundwater, surface water, wetlands, and fish and fish habitat through runoff or direct interactions at those VECs from a localized spill meandering into the receiving watercourses, potentially resulting in degradation of water quality or even mortality of fish during all Project phases.</p>	<ul style="list-style-type: none"> • Loads of fill material will be thoroughly checked and secured for delivery to minimize potential for spillage and any spills will be promptly removed following applicable safety procedures; • Equipment shall be kept in good working order and maintained so as to reduce risk of spill/leaks and to avoid water contamination; • Spill response kits will be provided on site for each piece of equipment to ensure immediate response to a potential waste release and will be stocked with supplies to handle a worst-case scenario in surface or groundwater; • Onsite workers will be required to be knowledgeable of how to use spill kits prior to engaging in any onsite work; • Routine maintenance, refueling and inspection of machinery will be performed off-site or on level ground onsite; • Corrective measures will be implemented immediately; • Secondary containment and limited quantities of chemicals and fuels required to be stored on site shall be in an area away from the surrounding terrestrial environment, or direct pathways (i.e., ditches) to the surrounding environment; • If contaminated soil is encountered, it will be reported to NSE and managed utilizing the Nova Scotia Contaminated Site Regulations; • Refueling, oiling, and maintenance of equipment will be completed in specifically designated areas located at least 30 m away from any watercourse, wetland to minimize potential effects that could arise in the event of a spill; and • Servicing of equipment will be completed off-site by a licensed mechanic; however if required to be

Potential Interactions due to Unplanned Events, Malfunctions and Accidents	Proposed Mitigative Measures
	<p>completed on-site, the work will be completed over an impervious surface.</p>
<p>In the event of the failure of erosion and sediment control (ESC) measures, the discharge of runoff containing sediment to watercourses (i.e., surface water) and fish and fish habitat during storm events or spring runoff may result in the degradation of those VECs on a temporary basis.</p>	<ul style="list-style-type: none"> • Construction of the ESC measures will be completed using quality materials and sound and proven construction practices in accordance with industry best practice; • Periodic inspection and maintenance (as required) of the ESC measures will be carried out, particularly prior to and following each major precipitation event; and • In the event of a significant ESC failure that results in noncompliance with a permit/approval, all work will be immediately stopped, and all available resources will immediately focus on mitigating the failure(s) in an effort to minimize negative impacts; and • An EMP has been developed for this project (Appendix O) and includes details on measures that will be followed.
<p>Several factors including but not limited to the accumulation of fill and materials for long periods of time, and minimizing disruptions at night (i.e., lights pointed up) can all increase the potential for interactions with wildlife (i.e., birds), potentially causing avoidance, sensory disturbance, or even mortality.</p>	<ul style="list-style-type: none"> • Rubbish and waste materials will be kept at minimum quantities and burning of this material will be prohibited; • Waste materials will be collected on a regular basis and disposed of at an appropriate approved facility; and • If work is required at night, the area will be appropriately lit with shielded lights pointing downwards.
<p>Fire may result in a loss of vegetation which has the potential to impact important habitats, agricultural and forestry resources and food sources.</p>	<ul style="list-style-type: none"> • Chemical and petroleum hydrocarbons will be stored in appropriate containers and in specifically designated areas to reduce potential for leaks. Where applicable, secondary containment of chemicals or petroleum hydrocarbons will be employed; • Oily rags will be stored in approved receptacles and disposed of at approved waste facilities; • No fires will be lit onsite; and • If fuel storage is required onsite, double walled fuel storage tanks will be required; and • An EMP has been developed for this project (Appendix O) and includes details on measures that will be followed.
<p>Harm to humans or wildlife as a result of collisions or accidents with equipment or vehicles throughout the project duration.</p>	<ul style="list-style-type: none"> • Work entailing use of toxic or hazardous materials, chemicals, or otherwise creating hazard to life, safety of health, will be conducted in accordance with National Fire Code of Canada to minimize the potential for spills or fires;

Potential Interactions due to Unplanned Events, Malfunctions and Accidents	Proposed Mitigative Measures
	<ul style="list-style-type: none"> • Occupational health and safety measures will be in place throughout all phases of the Project; • Detour and other traffic control signs will be posted where necessary during construction to minimize traffic within the construction site; • Delivery of materials to site will be scheduled outside of peak traffic times, when possible; • Truck drivers will adhere to posted speed limits and warning signage and adjust driving to meet weather and road conditions; • All necessary permits will be obtained and industry best practices will be followed for special moves or traffic interruptions on public roads; • Any potential modifications to intersections for access to the Project Area will follow appropriate traffic controls and permitting; and • The construction schedule will be shared with nearby residents; and • An EMP has been developed for this project (Appendix O) and includes details on measures that will be followed.

Significance of Residual Effects

With the implementation of the planned mitigation, and with the careful development and implementation of environmental protection, contingency and emergency response plans to be applied in the unlikely occurrence of an accident, malfunction, or unplanned event, interactions between the Project and the environment arising from an accidental event are not anticipated to be substantive.

7.5 Cumulative Effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions (Hegmann et al. 1999). This area of the province has a number of existing wind energy developments. The nearest wind farms are as follows:

- Higgins Mountain Wind Phase I, a 3.6 MW project located approximately 9 km east from the Project. This project was commissioned in 2006.
- Fitzpatrick Mountain Wind, a 0.8 MW project located approximately 28 km from the Project. This project was commissioned in 2007.
- Nuttby Mountain Wind, a 50.6 MW project located approximately 40 km east from the Project. This project was commissioned in 2010.
- Amherst Wind, a 32 MW project located approximately 45 km from the Project. This project was commissioned in 2012.

Additional anthropogenic activities and developments near the Project include, but are not limited to:

- Historic and ongoing forestry activities within and adjacent to the Project area;
- Historic and ongoing agricultural activities within and adjacent to the Project area;
- Operational and proposed expansion of a quarry adjacent to the Project area;
- Existing major transmission line corridor adjacent to the Project area;
- Existing telecommunication towers and associated infrastructure, including overhead power lines and access roads;
- Existing local roads, provincial roads, and Trans-Canada highway; and
- Operation of motorized vehicles (heavy equipment, passenger vehicles, and recreational vehicles including All Terrain Vehicles and snowmobiles) within and adjacent to the Project area.

The location of the Higgins Mountain project relative to the Project suggests the potential for interaction between the residual effects of the projects is low. Regional population-wide effects due to the individual residual effects of each project would be unlikely and if such effects occurred they would likely be negligible and unmeasurable. In the context of other infrastructure that is also a source of collision effects, such as those listed above, the cumulative effect of these projects on migrating birds and other wildlife is expected to be negligible.

The anticipated cumulative effects on mainland moose, as well as other terrestrial wildlife are anticipated to be negligible. While Westchester is within an area considered to be Core Habitat in the Mainland Moose Recovery Plan (NSDNRR 2021), anthropogenic areas including agricultural fields are not considered part of Core Habitat as they do not meet the diverse biophysical requirements. As the proposed turbines are to be constructed in a primarily agricultural area there is a reduced risk of effects to moose and their habitat.

The anticipated cumulative effects on migratory bats and birds are anticipated to be negligible and unmeasurable. In the context of other infrastructure that is also a source of collision effects, such as transmission/distribution lines, roads and communication towers, the cumulative effect of these projects on wildlife, specifically on migrating birds is expected to be negligible (Zimmerling et al. 2013).

7.6 Summary of Effects

Based on the assessment of the effects of the undertaking on the environment, the Project effects have been evaluated and a summary of the assessment is presented in Table 54 with the following criteria:

- Nature: positive (+), negative (-), or No Impact, where no impact is predicted;
- Magnitude: size of the potential impact – small, medium, or large;
- Reversibility: reversible (REV) impact or irreversible (IRR) impact;
- Timing: Duration of the anticipated impact – short or long-term;
- Extent: spatial extent of the impact – local, regional, provincial;
- Residual Effect: characterization of the residual effects – negligible, minor, significant, beneficial, or no impact.

TABLE 54: SUMMARY OF THE RESIDUAL EFFECTS FOR THE PROJECT

Assessment of Potential Effects of Project on VECs						
VEC	Nature	Magnitude	Reversibility	Timing	Extent	Residual Effect
Physical Environment						
Weather Conditions	No Impact	small	N/A	Short	Local	Negligible
Climate and Climate Change	+	small	N/A	Long	Provincial	Beneficial
Ambient Air Quality	-	small	REV	Short	Local	Negligible
Ambient Sound Levels	-	small	REV	Long	Local	Negligible
Geology	-	small	IRR	Short	Local	Negligible
Surface Water	-	small	REV	Short	Local	Minor
Groundwater	-	small	IRR	Long	Local	Minor
Shadow Flicker	-	small	REV	Long	Local	Minor
Visual Aesthetics	-	small	REV	Long	Local	Minor
Biophysical VECs						
Vegetation	-	small	REV	Long	Local	Minor
Wildlife	-	small	REV	Long	Local	Minor
Wetlands	-	small	REV	Short	Local	Minor
Birds and Bird Habitat	-	small	REV	Short	Local	Minor
Bats and Bat Habitat	-	small	REV	Short	Local	Minor
Fish and Fish Habitat	-	small	REV	Short	Local	Minor
Species at Risk	-	small	REV	Short	Local	Minor
Socioeconomic VECs						
Economy	+	Small	N/A	Short	Local	Beneficial
Land Use and Value	-	small	REV	Short	Local	Negligible
Transportation	-	small	REV	Short	Local	Negligible
Human Health and Safety	-	small	REV	Long	Local	Negligible
Cultural and Heritage VECs						
Archaeological and Cultural Resources	No Impact	N/A	N/A	N/A	N/A	No Impact