SECTION 4.0 – DESCRIPTION OF THE EXISTING ENVIRONMENT

Section 4: *Description of the Existing Environment* is based on the discussions and information from stakeholders and regulators which were identified in the Scoping Study (Section 3). This information was used to identify VECs and site specific component studies necessary for the analysis of potential project specific impacts on these VECs. The findings of these studies were integrated into the project design through revisions to siting plans for turbine locations and access road layouts. This section describes the existing environment of the project area, identifies valued ecosystem components (VEC's) and provides brief summaries of their characteristics. Impacts on these VECs and socio-economic issues are identified and evaluated in more detail in Section 5, with mitigation options.

4.1 Aquatic Environment

Dalhousie Mountain is located in the eastern part of the Cobequid Hills. While there are no lakes on this mountain, it has headwaters for the following streams:

1. The Steel Run flows south west from Mount Ephraim to Truro.
2. The Eight Mile Brook flows east from between Mount Ephraim and Dalhousie Mountain through Brookland and into the West River, Pictou County.
3. The Six Mile Brook flows off the north side of Dalhousie Mountain from the highest point of Lloyd Maclean's Sugar bush and also into the West River, Pictou County.
4. The West Branch River John starts between Mount Ephraim and Dalhousie Mountain through to West Branch and towards River John.
5. The Diamond Brook Flows down the north side Dalhousie and eventually into River John.
6. The Mackay Brook also flows down the north side into the Black River then to River John.

No stream surveys pertinent this region were located in a literature review of the library of the Inland Fisheries Division of the NS Department of Fisheries and Aquaculture.

A network of roads associated with the former settlement and recent forestry activities criss-cross the mountain. This network of woods roads has developed over the years with various-sized culverts to provide drainage for the existing brooks. Two man-made ponds are located on the mountain. Beaver are present in those ponds and elsewhere on the mountain. Headwater tributaries of streams like Six Mile Brook become large enough on the mountain to contain aquatic habitats that support small speckled trout populations. Other forested headwater streams are small but contain clear, cold water and offer classic speckled trout headwater habitats for spawning and rearing downstream. A number of small resident trout may be old enough to contribute as breeders, and fall spawning adults may move upstream into this area.

4.1.1 Surface Water and Seepage Areas

Field surveys encountered places where groundwater seepage is evident on the forest floor. These were identified in Blaney and Mazerolle's vascular plant survey as near proposed turbine sites 11, 12, 19, 20, 36, 44 and 45. In May, 2008 biologist Bob Bancroft reviewed areas that remained after several of the initially proposed turbine sites were eliminated from the updated plan to avoid seepage. These sites are damp forest sites that contain terrestrial rather than aquatic vegetation as ground cover. No sites that were visited near the proposed turbine locations would fall under the definition of wetland as presented in “A Proponent's Guide to Environmental Assessment”.

Figure 4.1 shows locations of streams, wet areas, and water crossings. Appendix AS 6 provides the permitting for Watercourse Alteration and Culvert Installation.

4.2 Terrestrial Environment

Dalhousie Mountain is located in the eastern part of the Cobequid Hills. Dalhousie Mountain is bounded on the north by the Cobequid Mountains and to the east by well-settled farm land and small communities within the West River watershed. It is removed from the direct effects of the Atlantic Ocean. Some higher elevations of the mountain support a hardwood forest composed of sugar maple, yellow birch and to a lesser extent beech. On shallow soils, balsam firs as well as red and black spruce are found. Poorly-drained areas have black spruce and balsam fir. Hemlocks were not found in ravines. The area was settled in the 1800's when farmsteads were cleared. A school, post office and several saw mills were built.

Soils were categorized at a later date by soil scientists as Class 7, which means they have no capability for arable culture or permanent pasture. Most of the farms and the community were abandoned in the early 1900's. White spruce reclaimed the old fields. The remaining forest area had been logged in the early 1900's. It grew back in spruce, fir, poplar and maple. Since 1990, large privately-owned sections have been clearcut and either replanted in Norway or white spruce, or left to regenerate in balsam fir.

The Trans Canada Highway 104 and Mount Thom lie to the south. Lands to the immediate west are under intensive forest use. About two kilometres to the west lies the eastern boundary of the Gully Lake Wilderness Area. This 3,810 hectare property has a softwood component but more notably hosts a mature sugar maple - yellow birch hardwood complex that offers superb wildlife habitat.

Some higher ground remains covered in hardwoods, and a maple syrup operation is located in one part of the mountain. Species status was determined using the *Species at Risk Act (SARA)*, the *Nova Scotia Endangered Species Act* (NSESA), and the NSDNR General Status of Wild Species List. Figure 4.2 shows the project location in relation to the Gully Lake Wilderness Area.

Key Map

Dalhousie Mountain Wind Farms

Diamond Brook

MacKay Brook

Six Mile Brook

Dalhousie Settlement

Dalhousie Mountain

Mount Ephraim

Brookland

Lower Mount Thom

P1-25 P1-27 P1-1 P1-9 P1-43 P1-10 O-14 P1-22 P1-24 P1-15 D P1-6 P1-21 C P1-45 O-38 P1-17 O-17 P1-19 P1-23 P1-26 P1-8 P1-7 P1-34 P1-40 P1-39 O-44 P1-37 P1-16 P1-11 P1-12 P1-18 P1-41 P1-42 P1-13 P1-3 B P1-36 O-33 O-20 P1-5 O-35 A P1-46 P1-28 P1-4

Fire Tower (P) Rd

Glen Rd

Brookland Rd

Steele Run

Highway 4

104

School Rd

Cove Rd

Mount Thom Rd

Black Rd

Flight Rd

RMS energy

Dalhousie Mountain Wind Farms

Figure 4.1
Access Roads and
Surface Water Systems

Legend: Scale 1:30,000

Project Features

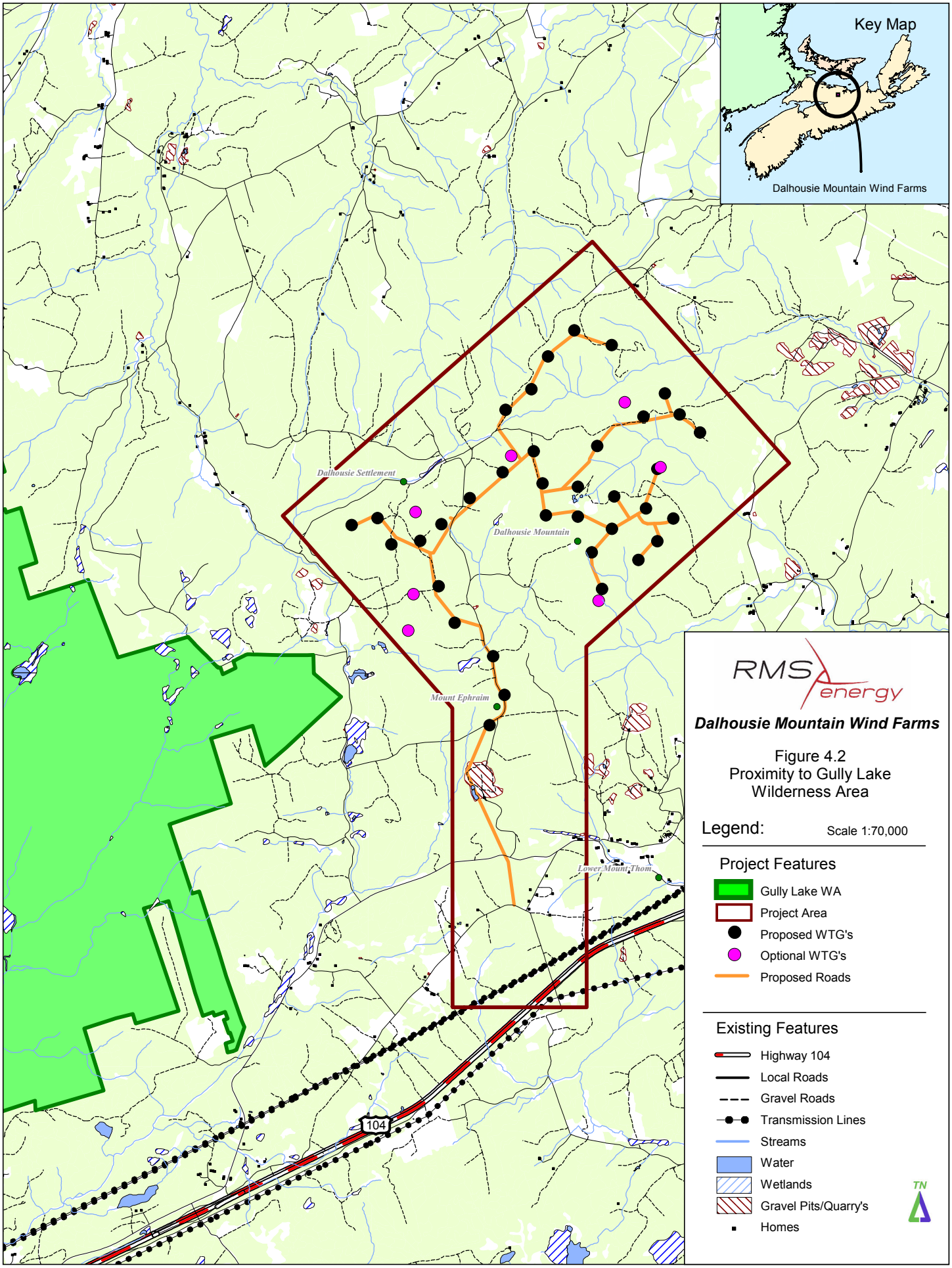
- Project Area
- Proposed WTG's
- Optional WTG's
- Water Crossings
- Proposed Roads
- Project Operations Facilities

Existing Features

- Highway 104
- Highway 4
- Local Roads
- Gravel Roads
- Transmission Lines
- Streams
- Water
- Wetlands
- Gravel Pits/Quarry's
- Homes

TN

Contour Interval 20 m (a.s.l)


Key Map
Dalhousie Mountain Wind Farms
Dalhousie Settlement
Dalhousie Mountain
Mount Ephraim
Lower Mount Thom
104
RMS energy
Dalhousie Mountain Wind Farms
Figure 4.2
Proximity to Gully Lake
Wilderness Area
Legend:
Scale 1:70,000
Project Features
Gully Lake WA
Project Area
Proposed WTG's
Optional WTG's
Proposed Roads
Existing Features
Highway 104
Local Roads
Gravel Roads
Transmission Lines
Streams
Water
Wetlands
Gravel Pits/Quarry's
Homes
TN

4.2.1 Flora/Botany

A detailed field study entitled "A vascular plant inventory of the proposed wind turbine array, Dalhousie Mountain, Nova Scotia with notes on plant communities and breeding birds" was undertaken by Sean Blaney and David Mazerolle of the Atlantic Canada Conservation Data Centre during June, 2007 (See Appendix C4). About half of the 41 potential sites they evaluated were in areas that had been clearcut or were former fields that were colonized by white spruce. A quarter of the sites were young to intermediate-aged deciduous or mixed forest, and the balance were in mature deciduous woods with minimal human disturbance.

Blaney and Mazerolle identified a seepage area under sugar maple and yellow birch forest with an uncommon but not provincially rare plant community. They found two rare plant species: Round-Lobed Hepatica (Hepatica nobilis var. Obtusa); and Squashberry (Viburnum edule). These two are ranked respectively under the NS General Status list as *May be at Risk* and *Sensitive*, which makes them a concern for NSDNR staff. Seven others of lesser significance were located and noted in their inventory.

4.2.2 Terrestrial Wild Animals

The wildlife in this region is supported by the climate, geophysical features and habitats that have been previously described. Notably, there are mature hardwood habitats, some remaining old field white spruce, younger softwood and mixed wood habitats as well as softwood plantations and cutovers. Large mammalian species in this area include black bear, white-tailed deer, coyote, bobcat, otter, fisher, snowshoe hare, mink, muskrat, short-tailed weasel, beaver, porcupine, northern flying squirrel, red squirrel and chipmunk.

Striped skunk, red fox, and raccoon may also be found on the mountain, and woodchucks probably inhabit some old farm foundations. A variety of smaller mammals including mice, voles, shrews and the star-nosed mole inhabit the forest floor and woody debris on it.

Seeps, small (first-order) streams and the riparian land around them are important habitats for a variety of amphibians – frogs and salamanders. Probable inhabitants include northern spring peeper, green frog, wood frog, northern leopard frog, eastern American toad, blue-spotted salamander, yellow-spotted salamander and eastern redback salamander. These species are based on the authors experience as a regional biologist for the area. Maritime garter snakes are certain inhabitants as well.

4.2.3 Birds

Birds are vulnerable to disturbance during land clearing operations before the installation of turbines. They can suffer injury or mortalities if they fly into moving turbine blades. They can be particularly vulnerable during spring and fall migrations.

A Bird Monitoring Study was undertaken by Steve Vines in 2007/2008. Breeding bird surveys were conducted in the spring and summer, with spring and fall migration monitoring, a winter survey and a fall Raptor Watch (see Appendix AS: 5). Blaney and Mazerolle in their 2007 vascular plant survey also undertook a breeding bird survey (see Appendix C4)

One species listed by the Committee on the Status of Endangered Species in Canada (COSEWIC) was detected. That species, the olive-sided flycatcher, is listed as "threatened". It's preferred habitats are clearcut sites with regenerating softwood or mixed wood forests, and also bogs and burns.

The olive-sided flycatcher and two other species found in the study area are given yellow designation by NSDNR as sensitive to human activities or natural events. The additional species are Gray jay and Boreal chickadee (see Appendices 4 & 6). Both species frequent boreal (primarily softwood) forests.

The preferred habitats for these three species of concern are generally located at lower elevations in the Dalhousie Mountain area. The proposed turbine locations at the highest elevations tend to be on well-drained sites suitable for hardwood forests.

4.2.4 Bats

Bat populations are vulnerable to human disturbance and changes in forest vegetation. If wind turbines are erected along traditional bat migration routes, the rotating blades can kill bats during spring and fall night-time flights to and from overwintering sites.

In 2007 Hugh Broders and Lynne Henderson undertook a study of the local bat population. Their report "Bat Species Composition and Activity at the Proposed Dalhousie Mountain Wind Development Site, Nova Scotia" was published in November, 2007 (see Appendix C7). There were no unexpected species recorded, nor was there an indication that the Dalhousie Mountain Wind Farm lies along a migration route.

4.2.5 Other Species of Concern

4.2.5.1 Plants

In Nova Scotia, a data search is required for species of concern. Atlantic Canada Conservation Data Centre (ACCDC) was contacted to provide a 100km search from a center point in the Dalhousie Mountain Wind Farm area (see Appendix C3).

Vasular plants were studied by Blaney and Mazerolle in 2007 (see Appendix C4). They located and mapped nine rare plant species. Two rare plant species; Round-Lobed Hepatica (Hepatica nobilis var. Obtusa) and Squashberry (Viburnum edule) are ranked respectively under the NS General Status list as *May be at Risk* and *Sensitive*, which makes them a concern for NSDNR staff. Seven other marginally rare species were located and noted in their inventory. They are: Early Coralroot (Corallorhiza trifida); Broad-Leaved Twayblade (Listera convallaroides); Tall Millet-Grass (Millium effusum var. Cisatlanticum); Dwarf Ginseng (Panax trifolius); Large Roundleaf Orchis (Platanthera orbiculata); Red Trillium (Trillium erectum); and Braun's Holly-Fern (Polystichum braunii).

4.2.5.2 Invertebrates

The 100 km search yielded three possible butterfly species with red status: Jutta Arctic; Early Hairstreak; and Bog Elfin. Six species had yellow status: Monarch; Hoary Comma; Satyr Angelwing (Comma); Arctic (Titania) Fritillary; Short-tailed Swallowtail; and the Northern Cloudywing. These are listed with scientific names and habitats in Section 4 of Appendix C3.

Eight species of dragonflies and damselflies (Odonata) with red status and eight with yellow status were brought to our attention by the 100 km search. These are listed with scientific names and habitats in Section 5 of Appendix C3.

4.2.5.3 Reptiles and Amphibians

Blandings Turtle, Wood Turtle and the Northern Ribbon Snake were candidates for consideration in this study. See Section 2 of Appendix C3.

4.2.5.4 Mammals

Moose, lynx and American martin had red list status for the purposes of this study. Five species were yellow status: Fisher; southern flying squirrel; eastern pipistrelle (bat); the long-tailed shrew; and the Gaspe shrew. See Section 1 of Appendix C3.

4.3 Socio-economic Environment

The socio-economic setting of the project area is characterized as a rural area which provides employment and income for those in forest related industries. Soils in the region are not suitable for agricultural use and previous farming activities have been largely abandoned.

As with many rural areas of Nova Scotia, a decline in population has occurred in the region. The productive capacity of the traditional industrial sector of the region has aged and now lags behind modern industrial capacity in other areas and countries. This change has led to the closure of industries which were at one time the mainstay of employment incomes and regional revenues. New development opportunities in the region are required to sustain municipal tax revenues which are used to maintain the standards of services provided to the communities.

4.3.1 Existing Land Use

The land uses over the last one hundred years have been farming, forestry, recreational uses, Christmas tree cultivation, maple syrup and hunting. All of these uses still exist, except for farming. No dwellings occupied by people currently exist on Dalhousie Mountain.

4.3.2 Air Quality

The generation of wind power is a zero emission way to create electricity. "Green power" in Nova Scotia is absolutely necessary to offset the huge appetite for household consumption when compared per capita to other Provinces and Countries. Currently, about 90% of Nova Scotia's electricity comes from non renewable and polluting resources. During the burning, process emissions from coal, oil, petroleum coke, natural gas or other fossil fuelled thermal electrical generation are being released into the air for plants, wildlife, aquatic life and humans. Air is 78% nitrogen, 21% oxygen and 1% other gasses such as carbon dioxide. The impact of adding large amounts of Green House Gases (GHG) and other specific air emissions are CO_2e, NO_x, SO_2, particulates, heavy metals and salts. These polluting gasses are affecting the Province's natural balance and leading to global climate change.

4.3.3 Environmental Noise

Noise is always a concern for a project of this nature. The bylaw introduced in 2007 by the Municipality of Pictou County has determined that noise is a major consideration when setting the 600m setback from residences. A noise study was completed using Wind Pro software to predict the decibel rating at the residences within 2 KM of the nearest turbines (see Figures 5.2 and 5.3)

4.3.4 Visual Land Features

An assessment of the scenic features of the project area are identified as a public issue for wind farm developments in Nova Scotia and many other jurisdictions. A photomontage was prepared to illustrate the visible effect of the wind farm. A photograph was taken from Saltsprings and computer generated images of turbines

were superimposed to provide a visual picture of what the Wind Farm would look like with up to 45 turbines. A viewplane analysis was conducted to illustrate the distribution of visible turbines over the surrounding area. A visual representation map was created using modelling software showing the amount of turbines visible from all locations within 20 km from turbine #11. These analyses and discussion of impacts are presented in Section 5.9.

4.3.5 Public Health and Safety

Safety policies with company procedures have been put in place to ensure the Project complies with all industry standards and good utility practice. Electrical installations connecting to the Provincial grid must comply with and maintain certification and liability insurance throughout the life of the project. In order to obtain a final connection permit, completion certificates from Federal, Provincial and Municipal offices must be granted throughout the construction phase. The Municipality has setback distances from public roads at 300 m away, from houses at 600 m and the height of the turbine away from a non-participating property line. Setbacks greatly reduce the risk of the general public from being involved in situations that could be hazardous. An insurance policy has been reviewed with an experienced underwriter in the field which identifies areas of concern and how to reduce these risks.

4.3.6 Aboriginal Interests

In accordance with provincial guidelines and regulations, an Archaeological Resource Impact Assessment has been carried out by Davis Archaeological Consultants Limited (Davis) on behalf of the Proponent. The desktop study included: archaeological, historical, Aboriginal, natural heritage, zoological, botanical resources for both terrestrial and aquatic environments. A late archaic projectile point (bjCr-01) was found over 500 m east of turbine P1-15 and P1-10. The nearest band of Aboriginal People is Pictou Landing First Nations located 25 km east of Turbine P1-11.

No known First Nations archaeological sites have been located on Dalhousie Mountain. The Confederacy of Mainland Mi'kmaq (CMM) are undertaking a Mi'kmaq Ecological Knowledge Study (MEKS) of the area. CMM staff will complete a field study during the spring and summer of 2008.

4.3.7 Heritage sites, Archaeological Sites and other Cultural Resources

In accordance with provincial guidelines and regulations, an Archaeological Resource Impact Assessment has been carried out by Davis Archaeological Consultants Limited (Davis) on behalf of the Proponent. The desktop study included: archaeological, historical, Aboriginal, natural heritage, zoological, botanical resources for both terrestrial and aquatic environments. A late archaic projectile point (bjCr-01) was found over 500 m east of turbine P1-15 and P1-10. The desk top study indicated that there are no

registered Heritage Sites identified on the sites. This study also identified the potential presence of early settlements of Scottish immigrants to the area. The desktop study is presented in Appendix C9.

In the findings of the desktop research, Davis Archaeological Consultants Limited writes:

> *Historical documentation and previous archaeological research suggest a hierarchy of regions within the study area of high, moderate and low potential for First Nations archaeological resources based on both the natural landscape and cultural resources. It is doubtless that Mi'kmaq people and their forebears were living in the Pictou area and using the complex of natural resources that occur in the County and its contributing watersheds for thousands of years. Historic period settlement and use of the area has also been identified through documentary and archaeological research. As the eighteenth century progressed, Pictou township and the surrounding landscape was increasingly colonized by people from the southern colonies, such as Crawley and Company, and waves of Scottish immigrants, beginning with the Hector in 1773 and continuing, most directly within the study area, with the Dumfrieshire settlers in 1815-1818. The area has been determined to be of high potential for eighteenth and nineteenth century archaeological sites associated with Scottish settlement and use of the area. Nine historic archaeological sites have been previously recorded within the Maritime Archaeological Resource Inventory near the study area. Additionally, there is moderate potential for First Nations' resources within the study area and a confirmed site adjacent the study area may serve only to increase that potential.*

The majority of the turbine sites will be located on previously disturbed forestry land and logging roads that have been in various stages of heavy production for the last 40-50 years. Therefore, the potential for the discovery of as-yet undiscovered artefacts may be limited or nonexistent

In May 2008, Davis conducted an archaeological field study in accordance with the Special Places Protection Act of Nova Scotia Tourism, Culture and Heritage Permit # A2007NS40. The field study was conducted over and around the selected turbine locations and along the access road corridor to identify and map potential historical resources in the work areas. Discussions were held with landowners to identify any previous settlement foundations and cemeteries. Davis identified the five following sites of archaeological significance in the project area:

- The *John Aurthur House* and nearby *Possible Cemetery*
- The *Charles McIntosh House*
- The *John L. Rae House*
- The *John Mackenzie Jr. House*, barn and nearby circular depression
- The *William Reid House*

None of these sites are within the areas scheduled for access roads or turbines and no disturbance of these sites is anticipated as a result of project activities.

Research conducted by the Proponent in conjunction with the preliminary assessment indicated the possibility of archaeological findings to be limited due to the circumstances and reasons the settlers moved. In many conversations, site inspection walks and drives with families of the early settlers (Mackenzie, Adamson, Sutherland, Mackinnon, and Mackay) it was acknowledged that the "Scots" were well known for not leaving anything behind when they moved. They dismantled and moved barns, houses, fencing, tools and personal items. The Proponent has consulted the 1879 Pictou County Historical Atlas and spent over 600 hours site truthing the lands for property lines foundations, cemeteries, waterways, forest inventory etc., and has identified and recorded several areas to avoid.

In summary, site investigations along all existing and proposed corridors and construction pads has been conducted by the landowners, several study experts and the Proponent. The Proponent has conducted extensive searches for obvious indications of previously settled lots along all easements and turbine pads. The proponent will be involved directly in the supervision of the site work and machinery operations (excavators and bulldozers) to ensure that excavation and clearing does not take place outside the designated area of the plan.

The Proponent plans to clear tree and vegetation during winter months while the ground is frozen in order to reduce potential impacts on birds and animals and to reduce the potential erosion and silt runoff. The construction phase will follow as indicated in Section 2**.** During these activities**,** the Proponent will advise the N. S. Museum, the RCMP and Davis Archaeological Consultants Ltd. immediately if an archaeological find is located or suspected.

4.3.8 Waste Disposal

Construction activities at turbine sites generate wastes that must be properly handled. The wastes include: domestic wastes at work sites and construction areas; sanitary wastes; wastes associated with the maintenance of equipment; wastes from construction activities; waste packaging; and wood debris and excess soils for cleared areas.

4.3.9 Climatic Fluctuations and Extreme Events

Exposed mountain locations can experience weather extremes. Wind turbines that are installed on these locations must be able to withstand the range of weather conditions that occur in the area.

4.3.10 Construction-Related Traffic

Local traffic in the area includes: commuter traffic for local residents travelling to work in and around the area, some recreational and tourist traffic, trucks hauling sand and gravels from quarries, truck hauling timber and the transportation of heavy equipment for the construction and forest industries. Heavy machinery will be required to prepare the sites and large trucks to haul the turbines into their locations. No alterations to existing public roads will be required. Existing roads within the project boundary will have to be upgraded and some new roads constructed to deliver the machinery on sites.

4.4 Identification of Valued Eco-system Components (VECs)

Based on the discussions with stakeholders and regulators as shown in Section 1.10, the findings of Section 3, and environmental setting described in Sections 4.1, 4.2 and 4.3, bio-physical and socio-economic VECs have been identified for the assessment of potential project related impacts. Seventeen (17) VECs have been identified for further assessment.

Several VECs were identified at an early stage to be of greater complexity or higher relative ecological importance to the surrounding natural environment of Dalhousie Mountain. For these, an expert in the respective field was commissioned to compile a report detailing baseline data and to summarize the level of interaction and/or impact from the Project. The other VECs, while not unimportant, have been reviewed by: an expert in the field; a Government employee within the appropriate department; and a community representative. It was advised by these Stakeholders that detailed reports were not required for these VECs but an assessment of potential impacts was necessary for this report. The following summarizes the nature and scope of the VEC related studies and issues. The assessment and mitigations of potential impacts on VECs is provided in Section 5.

4.4.1 Flora/Botany

The presence of plant species of concern within the project area was considered likely by experts within DNR and NSE. Therefore, the flora of the project area, in the vicinity of the proposed turbine locations, and on proposed access roads was identified as a VEC.

A detailed field study of local flora determined that several species identified as important to the local environment were found near project sites. The project will protect these plants by visually flagging the location mapped by GPS and a buffer radius of 50 m from any soil disturbance will be applied (see Appendices C4 and AS:3).

4.4.2 Surface, Groundwater Quality and Fish Habitat

Surface water and fish habitat are protected under the Fisheries Act and are therefore considered a VEC. Discussions were held with NSE, DFO and the President of Saint Marie's River Association which identified the three main waterways leading off Dalhousie Mountain.

4.4.3 Species at Risk, Wildlife, and their Habitats

Species at Risk, wildlife and their habitat were identified as VECs through discussions with NSE, DFO, botanists, biologists, birders and the NS Museum. Two desktop studies and six field study reports were commissioned to assess the presence and distribution of species which might be categorized in this VEC.

4.4.4 Avian Species, including Migratory Birds

There has been extensive reporting of the interaction of avian species and wind turbines and for assessment purposes avian species are included as a VEC for this project.

Based on information which was gathered initially from Canadian Wildlife Services (CWS), it was determined that the project is not in a known Migratory Bird path. Data on local populations of avian species has been compiled from the following sources:

- Breeding Bird study, carried out in June, 2005, 5 Km north east on the Proponent's family farm during the installation of a 0.8 mw Wind Turbine.
- During the Botany study, the field experts took notes on resident bird populations and provided a table in the Plant Inventory Study.
- Breeding Bird and Migratory Bird Study including Raptors commissioned by RMSenergy was started in February 2007 and completed in mid July 2008.

All species found during the last three years were considered normal inhabitants of the area and in relatively low populations, especially during migration periods (see Appendix C4, 5, 6 and Appendix Supplement AS: 5)

4.4.5 Existing Land Use

Land use is a public issue of concern to landowners other stakeholders and various level of government and is therefore considered a VEC. The land uses over the last one hundred years have been farming, forestry, recreational uses, Christmas trees cultivation, maple syrup and hunting, and all of these uses still exist except for farming. The installation of the Wind Farm is not predicted to restrict any existing use of land on Dalhousie Mountain.

4.4.6 Air Quality

The project rational is based provincial, national and global concerns regarding the preservation of air quality and controls on the generation of Green House Gases (GHG). The use of wind to generate electricity provides a renewable resource which does not require the combustion of fuel and the resulting atmospheric emissions. As such Air Quality is considered a VEC for this project.

4.4.7 Environmental Noise

Noise issues are a much publicised impact of wind projects particularly in relation to adjacent residential properties and therefore environmental noise is a VEC for this project.

4.4.8 Bats

Conversations with government experts early in the planning stages expressed a concern that this was an unknown area for Bat Habitat. Due to the lack of existing information and concerns related to the interaction of wind turbines and bats, bats were selected as a VEC for this assessment. A one-month bat monitoring study was conducted during August and September 2007. The findings of this study are reported in Appendix C7.

4.4.9 Visual Landscape

The effects of the installation of wind turbines on the local landscape can be an issue of widespread public debate and therefore the visual landscape is considered a VEC.

4.4.10 Public Health and Safety

Public health and safety covers a range of activities which include the use of public roads and the safety of individuals and landowners particularly during the construction period. For this reason, public health and safety is a VEC for this assessment.

4.4.11 Heritage Sites, Archaeological sites and other Cultural Resources

Provincial guidelines and regulations are in place for the purpose of preserving the historic resources of the province. Therefore these resources are considered a VEC for this assessment and an Archaeological Resource Impact Assessment was carried out by the Proponent.

4.4.12 Waste Disposal

Waste materials generated by the development are considered an issue of environmental stewardship. Waste management and disposal has been identified as a VEC by the proponent.

4.4.13 Neighbourhood and Community Characteristics

Neighbourhood and community characteristics are identified as a VEC because of potential impacts on the local community from the project.

4.4.14 Climatic Fluctuations and Extreme Events

Climatic Fluctuations and extreme events identify potential impacts of the existing environment on the project and are key elements in establishing safe design criteria for the project components. Therefore climatic variations and extreme weather conditions are a VEC for wind power development and project design.

4.4.15 Soils, Terrain and Vegetation

The topography, soils and vegetation of the project area are considered a VEC as these features are important considerations in the assessment of environmental conditions and the suitability of the site for the construction of wind turbines.

4.4.16 Construction Related Traffic

The influence of additional construction related traffic on local traffic patterns and public road use is considered a VEC for this assessment.

4.4.17 Aboriginal Interests

Following discussions with First Nations leaders, aboriginal interests and concerns regarding traditional heritage issues are a VEC for this assessment. A field study was conducted May 2008 by Davis Archaeological Consultants. An MEKS by The Confederacy of Mainland Mi'kmaq is currently in progress to ensure no important unknown sites are disturbed. This report is anticipated to be completed in September-October 2008.

SECTION 5.0 – ASSESSMENT OF ENVIRONMENTAL IMPACTS, MITIGATION OF IMPACTS, RESIDUAL EFFECTS AND CUMULATIVE IMPACTS

5.1 Approaches to Assessment of Impacts

This section describes the likely effects of the Project on the Environment; cumulative environmental effects; potential for accidents and malfunctions; and the effects of the Environment on the Project and includes climatic fluctuations and extreme events.

The following process ensures that the interactions between the Project components and the Environment are adequately described; likely environmental effects are identified and properly assessed; measures are in place to mitigate potential impacts and the importance of any residual effect determined.

5.1.1 Valued Eco-system Components

Based on the Scoping Study (**Section 1 and 3**) and the Description of the Existing Environment (**Section 4**), the following VECs have been identified and will provide the focus for the evaluation in **Section 5:**

- Flora/Botany;
- Surface, groundwater quality and fish habitat;
- Species at Risk, wildlife, and their habitats;
- Avian species, including migratory birds;
- Existing land use;
- Air quality;
- Environmental noise;
- Bats;
- Visual Landscape;
- Public Health and Safety;
- Heritage sites, Archaeological sites and other Cultural resources;
- Waste Disposal;
- Neighbourhood and community characteristics;
- Climatic fluctuations and extreme events;
- Soils, terrain and vegetation;
- Construction related traffic;
- Aboriginal interests.

5.1.2 Potential Interaction Environment and the Project

For this assessment, the following activities identify most of the possible project interactions that would take place and that could cause environmental impacts. To facilitate the evaluation, a reference framework established by the *Canadian Environmental Assessment Act,* is to determine whether:

- The environmental effect is adverse;
- The adverse environmental effect is significant; and

- The significant environmental effect is likely.

Table 5.1 identifies criteria that will be referenced in the evaluation of potential impacts.

Table 5.1: Assessment of Impacts

Effect	Definition
Adverse	Threat to, or loss of, rare or endangered species
	• Reductions in species diversity
	• Loss of critical/productive habitat
	• Transformation of natural landscapes
	• Negative effects on human health or quality of life
	• Reductions in the capacity of renewable resources to meet the needs of present and future generations
	• Loss of current use of lands and resources for traditional purposes by aboriginal persons
	• Foreclosure of future resource use or production
Significant	• Magnitude
	• Geographic extent
	• Duration and frequency
	• Irreversibility
	• Ecological context
Likely	• Probability of occurrence
	• Scientific uncertainty

5.1.3 Mitigation Measure(s)

Mitigation measures cover the broad range of the Proponent's responses to potential impacts of the project of the VECs. Mitigation can be instituted in the design planning and site layout phase to avoid potential impacts on ecological systems. Mitigation can also be in the form of procedures and policies which are implemented in the construction and operations phases to prevent potential impacts while work is being conducted on site. The following definitions of "mitigation" will be used by the proponent.

- *Mitigation as described with respect to a project is the elimination, reduction or control of adverse environmental effects, including restitution through replacement, restoration, compensation or any other means for any damage to the environment caused by such effects. (Natural Resources Canada 2003, Screening of Inland Wind Farms);*

- *Mitigation in this section will be described on the basis of "avoidance of" and "prevention of" environmental effects where possible and by the use of good environmental practices where possible as opposed to repairing damage after the fact.*

5.1.4 Residual or Net Environmental Effects after Mitigation

The importance of residual effects after mitigation measures is determined using the definitions in **Table 5.2**.

Table 5.2: Level of Impact after Mitigation (residual)

Level	Definition
High -	Potential impact could threaten sustainability of the resource and should be considered a management concern. Research, monitoring and/or recovery initiatives should be considered.
Medium-	Potential impact could result in a decline in resource to lower-than-baseline but stable levels in the study area after project closure and into the foreseeable future. Regional management actions such as research, monitoring and/or recovery initiatives may be required.
Low -	Impact may result in a slight decline in resource in the study area during the life of the project. Research, monitoring and/or recovery initiatives would not normally be required.
Minimal -	Potential impact may result in a slight decline in the resource in study area during construction phase, but the resource should return to baseline levels of level of impact shown in Table 5-1.

5.2 Evaluation of Impacts

The evaluation of the VECs identified in Section 4.0 as having potential for impact by the proposed project are reviewed in this section for the each of the following interactions with:

- Boundaries:
- Access roads:
- Project Construction:
- Project Operation:
- Project Decommissioning:
- Malfunctions and Accidents:
- Mitigation:
- Cumulative Assessment:
- Sustainable Use of Renewable Resources:
- Residual Environmental Impact:

5.2.1 Botany and Flora

(Cited from Blaney study) *Fieldwork was conducted by Sean Blaney and David Mazerolle. We visited the study site on June 18, 19 and 20, 2007, spending 39.5 person hours on site and covering 52.1 km on foot. We had pre-programmed the proposed turbine sites into GPS units before fieldwork and visited each turbine site, taking*

photographs, recording notes on species composition, stand age of forested sites and any obvious disturbance history of the plant community present. We concentrated search effort on the footprint of the proposed development, but also moved outside the linear corridors of the proposed development to cover different or interesting habitats when noted or because of difficulties following straight lines through dense habitats.

We compiled a full vascular plant list for the site as a whole, with estimates of species' relative abundance as follows: rare – seen in small numbers in 4 or fewer locations; uncommon – seen in small numbers in approximately 5 to 8 locations, potentially in larger numbers at one or two of the locations; fairly common – seen in small numbers in approximately 8 to 12 locations, potentially in larger numbers at several of the locations; common – seen at more than 12 (estimated) locations. These categories are not intended to represent precise descriptions of abundance but do provide some measure of relative abundance.

For plant species tracked by the Atlantic Canada Conservation Data Centre (those ranked S1, S2, S3 or S3S4 in Nova Scotia, for which all locations are databased), we recorded GPS locations along with habitat descriptions and more detailed estimates of local abundance.

I. Site Coverage

Figure 1 maps the tracks covered on foot during the site visit by Sean Blaney and David Mazerolle. Tracks were recorded by GPS set to record position approximately every 15 seconds while moving (the "more often" track recording setting on a Garmin GPS 76Cx unit).

No site inventory is ever entirely complete, but we visited all turbine sites, walked along all development corridors and visited the full diversity of habitats within those areas. We are confident that the turbine sites and development corridors are relatively thoroughly covered for vascular plants, especially for native species, and that there is a very low probability of significant numbers of additional rare vascular plant species being present within the development footprint.

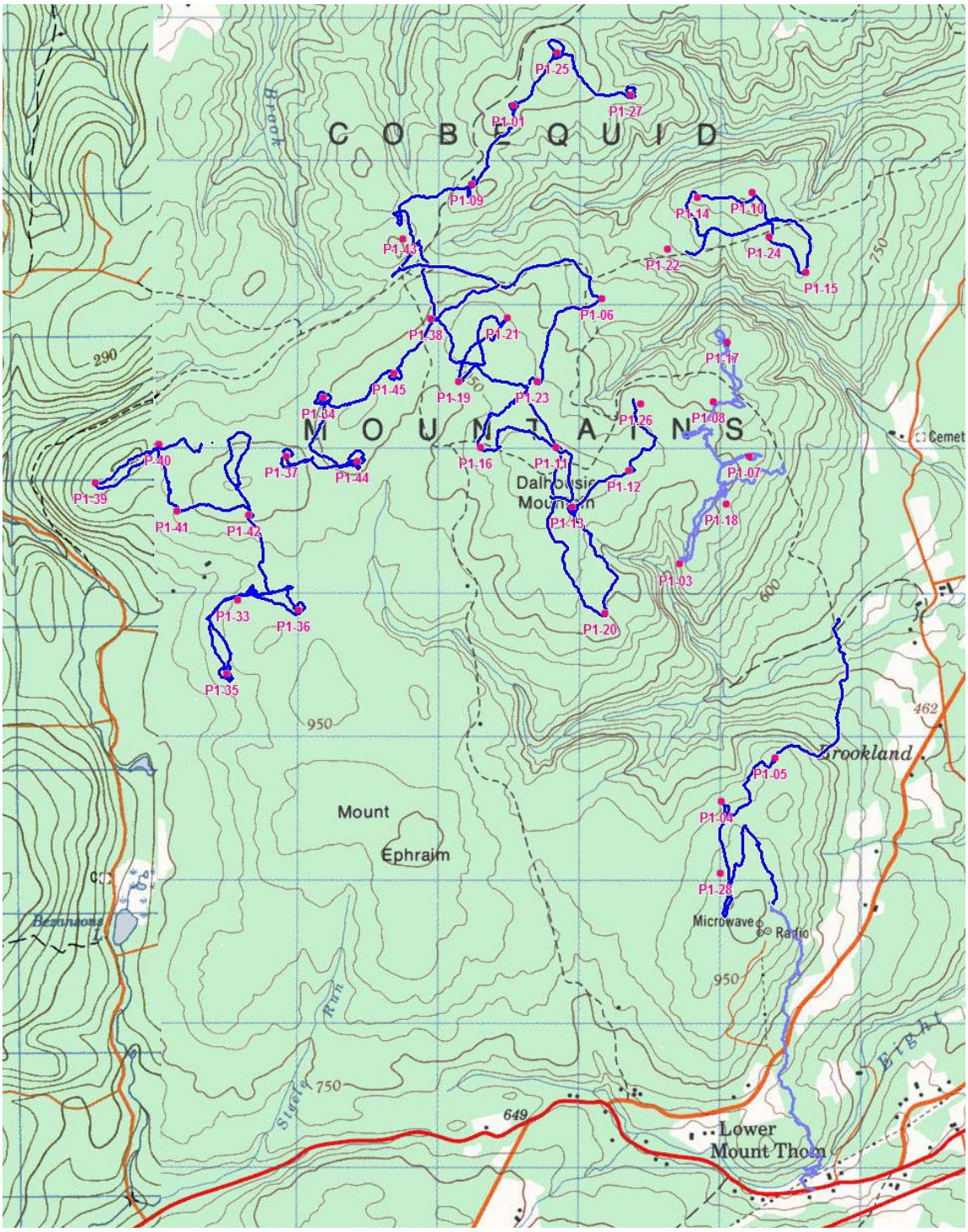


Figure 1 Map of on-foot site coverage on the June 18-20, 2007 survey, with proposed turbine locations. Both pale blue and dark blue lines are tracks recorded by GPS while on foot.

Boundaries

The effects on plants and their communities are considered immediate to the areas disturbed during construction of the roads and the turbine pads. For this study, a 40 m wide easement along all access roads from the interconnection point at the south to the substation and linking all turbines throughout the Wind Farm. Each specific turbine site study was conducted within a 75 m radius from the GPS location provided by the Proponent as listed in Table 2.1. Construction of the roads and turbine foundation may take place in any area within these bounds including moving a turbine to the outer edges of the radius of the defined study area. The ability to move within the study area boundaries (but not outside of) is very necessary to provide responsible consideration to many other environmental features within the immediate footprint such as:

- Finding suitable soil conditions for the foundation integrity by means of a geotech study performed by drilling and providing a split spoon sample for analysis;
- Ensuring previous land use such as foundations do not lie under the surface;
- Interference with nesting wildlife at the time of construction (this cannot be responsibly predicted until several days immediately prior to construction);

Regardless of the location of the roads or turbines within this pre-studied area, the overall land use size will not increase; it will merely be relocated within the 150 m studied areas. The layup area will remain under 0.5 ha and the roads will be wide enough to provide safe travel for the flatbed trucks and cranes and to locate the collector lines along the ditches.

Access Roads

During construction and operation, vehicular traffic along the designated roads will affect the Botany and Flora by reducing the habitat directly proportional to the width and length of the road.

Project Construction

During construction, the use of excavators, bulldozers and trucks will impact the plant communities that have a low mobility by removing and fragmenting the habitat.

The project has been planned using primarily all existing roads on previously cleared land. According to (Blaney 2007), the entire area does not support provincially rare communities and “The natural heritage value of the 22 proposed turbine sites in category one above is low because sites are already substantially human-altered, meaning that they are relatively good candidates for turbine development. Although certainly not provincially rare communities, the remaining turbine sites, especially those mature stands in category 3, are generally within good examples of the type of sugar maple – yellow birch – beech forest that predominates in the Cobequid Mountains of northern mainland Nova Scotia.”

No significant effect on Botany and Flora is predicted due to proper mitigation methods and work habits.

Project Operation

Since the Project is largely sited outside of vegetated areas and along existing roads, it is anticipated that any potential effect on plants and their communities will be of a temporary nature.

No significant effect on Botany and Flora is predicted due to proper mitigation methods and work habits.

Project Decommissioning

By following the same work procedures of the construction phase without the actual construction, the disassembly will require using the proposed existing routes and crane pads to remove the equipment. The roads will be left in place and the turbine locations will be re-vegetated as the landowner requires as it ultimately belongs to them; however, typically this would be in the form of merchantable wood as is the surroundings.

No significant effect on Botany and Flora is predicted due to proper mitigation methods and work habits.

Malfunctions and Accidents

The largest risks associated with all phases of any operations involving vehicles and machinery in forested areas is: contamination by petroleum products and waste, if spilled, migrating into the surroundings; and in extreme situations a risk of fire, causing damage if not controlled immediately. Contact with the local West River Fire Department Chief has determined that a procedure in place upon commissioning to deal with logistics of fires and spills would outline the appropriate measures for responding. A site map will be provided to the chief and to RMSenergy Ltd. employees, setbacks from sensitive areas will be in place as will radio communications to the control centre to provide lockout confirmation and procedures for safe contact with electrical components. NSE will be notified at the time of any applicable emergencies.

Mitigation

Efforts have been made to ensure that the Project is sited on previously cleared lands along existing roads and not in natural areas. However, limited clearing of trees will be required to facilitate the installation of the turbines and ancillary facilities such as the access roads and collector lines. From the vegetation point of view, the study area contains few constraints for wind power development since the preferred locations for turbines are: exposed, previously cleared areas; typically upland vegetation units; and the properties are almost invariably entirely located in forestry areas (all proposed sites, if not previously cleared, are slated for deforesting in the next few years regardless of the development of this project). Before construction, the limits of vegetation clearing will be staked in the field. The Construction Contractor will ensure that no construction

disturbance occurs beyond the staked limits and edges of woodlots and other sensitive areas adjacent to the work areas are not disturbed, including the areas near rare plants described in the survey carried out by Sean Blaney (see Appendix C4).

To the extent practical, tree and/or brush clearing where required will be completed prior to the spring season of 2009. Appropriate setbacks will determined for each listed rare plant species through on-going involvement with CWS and Sean Blaney prior to any construction taking place. The locations will be flagged and setbacks applied by Sean Blaney which will not be disturbed by construction crews. Locating the turbine sites outside of vegetated areas has largely precluded disturbance to local flora and its habitat.

Cumulative Assessment

In the short term, this Project will have a cumulative affect on the removal of vegetation in the area when combined with logging activities. However in the longer term, this cumulative impact is negated by logging activities which are taking place regardless of whether any wind power development proceeds. Due to the relatively small footprint of less than 2% land-use to operate a wind farm, combining these two activities would not be considered a cause of new significant negative net effects due to the forestry development scheduled to take place on the same lands as the turbines which is at the discretion of the landowner.

Sustainable Use of Renewable Resources

The project area falls within a region of high wind energy in the province. The generation of electricity at Dalhousie Mountain offers a sustainable source of renewable energy to supplement the province's power demands. This project does not conflict with the present use of the land for other renewable resources principally forest products.

Residual Environmental Impact

Although trees will be removed to facilitate this installation and it appears this will be of permanent nature, the impact can be brought to a "net zero" or to a positive improvement to the surrounding environment for two main reasons:

1. The road improvements will provide the existing users access to a main corridor which will allow many of the small trails and roads to go unused and become forested.
2. Providing a yearly income to the landowners that will more than offset any need to deforest the land surrounding the turbines.

The level of impact on Botany and Flora after protection and mitigation measures have been employed is rated as "minimal" (i.e., the resource should return to baseline levels).

5.2.2 Surface, Groundwater Quality and Fish Habitat

The Dalhousie Mountain area has several brooks flowing in three different water bodies:

1. The Steel Run flows south west from Mount Ephraim to Truro
2. The Eight Mile Brook flows east from between Mount Ephraim and Dalhousie Mountain through Brookland and into the West River, Pictou County.
3. The Six Mile Brook flows off the north side of Dalhousie Mountain from the highest point of Lloyd Maclean's Sugar bush and also into the West River, Pictou County
4. The West Branch River John starts between Mount Ephraim and Dalhousie Mountain through to West Branch and towards River John.
5. The Diamond Brook Flows down the north side Dalhousie and eventually into River John
6. The Mackay Brook also flows down the north side into the Black River then to River John

The brooks are detailed on the map Figure 4.1. As illustrated, the easement roads follow the existing access to Dalhousie Mountain. The initial site plan was changed to avoid crossing these brooks. Based on the findings from field visits, the site now avoids the brooks and has a planned route along an existing road used by all the landowners to access their lands. The new route now only crosses three small culverts which will be repaired to the new standards of NSE and one stream which will require an open bottom culvert.

This section refers to the project having:

- Negative effects on surface water quality, quantities, or flow;
- Significant sedimentation, soil erosion, or shoreline or riverbank erosion on/or off-site;
- Potential negative effects on surface or ground water from accidental spills;
- Negative effects on fish or their habitat, spawning, movement, or environmental conditions;
- Negative effects on groundwater quality, quantity, or movement.

Meetings with NSE in Granton and DFO in Antigonish have determined there are no wetlands or water-crossings that are not manageable using the standards laid out for the Watercourse Alteration Permit and that the best course of action was to chose the main route into the Project that avoids rather than crossing significant water courses or wetland areas. The following components have been considered as to how they interact with surface water, groundwater and Fish Habitat:

Boundaries

The zone of potential interference to the surface, groundwater quality and fish habitat could be along roads, power-lines and any area used for machinery assembly or maintenance. The minimum distance between residential houses where groundwater well are located and turbines is approximately 1.5 km. Project activities are sufficiently distant from residential wells so as not to pose a risk to potable water use in the area.

Access Roads

Potential impacts on the surface, groundwater quality and fish habitat along access roads are: dust; spills, sediment run-off and erosion, washouts from rainwater; equipment entering the water; and replacement or installation of culverts and or temporary bridge works.

Project Construction

Based upon the turbine locations, the alignment of the power line, collector lines, and access roads, it will be necessary to cross several small streams. Construction of the overhead lines will not require in-stream work.

Other potential effects to watercourses from Project construction activities include: possible erosion of stockpiled topsoil into the flood plain areas, which could result in a short-term and spatially limited increase in water turbidity and degradation of the water quality and fish habitat.

Project Operation

No effects to drains, watercourses, fish and fish habitat are anticipated during the operation of the Project.

No significant effect on **Fish Habitat** is predicted due to proper mitigation methods and work habits.

Project Decommissioning

Decommissioning activities will include trucking, cranes and heavy equipment to remove the turbines, power-lines and substation with the same interactions mentioned with construction without the construction of road works.

No significant effect on Fish Habitat is predicted due to proper mitigation methods and work habits.

Malfunctions and Accidents

The risk of malfunctions and accidents is present during all activities of the project. These risks include a risk of water contamination by sediment; run-off; spills; vehicle accidents; and fire.

Mitigation

As mentioned above, the intention is to adhere to the buffer zones when working near water bodies. However, in the unlikely event of any unforeseeable interactions, emergency response procedures will be in place to prevent potential impacts on aquatic habitat (see Section 2.3.3).

Cumulative Assessment

The potential disruption of surface, groundwater quality, fish habitat is not predicted to combine with any other activity on Dalhousie Mountain during the construction phases of the Project. During operation of the wind farm, increased flow of traffic, combined with the existing uses may increase. The cumulative impact of additional accessibility is predicted to be less due to the improved quality of the roads, culverts and ditches.

Sustainable Use of Renewable Resources

The project area falls within a region of high wind energy in the province. The generation of electricity at Dalhousie Mountain offers a sustainable source of renewable energy to supplement the province's power demands. This project does not conflict with the present use of the land for other renewable resources principally forest products.

Residual Environmental Impact

With the implementation of the above protection measures, no net effects are anticipated to the surface, groundwater quality and fish habitat. However, in the event that in-stream work is required and/or conditions arise that topsoil is positioned within the flood plain, any associated effects would be both spatially and temporally limited.

The level of impact after protection and mitigation measures have been employed is rated as "minimal" (i.e. the resource should return to baseline levels).

5.2.3 Species at Risk, Wildlife and their Habitats (Except Avian Species)

The following references were used by the Proponent and experts to identify the appropriate species of concern for component studies: (see Appendix C3)

- Contact with Bob Ogilvie, Manager, Special Places of the Nova Scotia Museum was initiated by the proponent in February 2007 to determine the issues to review and how they interact with the Project area on Dalhousie Mountain, See Environmental screening letter 07-01-25b (Appendix B)
- Atlantic Canada Conservation Data Centre (ACCDC) was contacted to provide a 100km search and was short listed for Dalhousie Mountain. (Appendix C3)
- *Species at Risk (SARA)*
- *Nova Scotia Endangered Species Act* (NSESA)
- NSDNR General Status of Wild Species List

In recognition of *SARA,* the *Migratory Birds Convention Act and* the *Nova Scotia Endangered Species Act*, consideration has to be given to those plants, birds, mammals, amphibians, reptiles and invertebrates that are listed as species of concern.

The desktop screenings for the species at risk were reviewed and identified as being known to reside or having the habitat suitable for sustained survival in the study boundaries of the project area indicated the following species of concern for the region of the project:

Mammals

- The Fisher is known to be scarce or absent in Pictou County. They are medium sized carnivores that prey on a wide variety of foods including birds, rabbits and porcupines. Distribution is likely governed by the availability of food, but the presence of overhead cover may also be an important factor (Strickland et al. 1982). Home range sizes of fisher vary up to 30 square km for adult males. The range of one male will overlap those of more than one female, but home ranges within adult sexes are mutually exclusive (Cannings et al. 1999). The Fisher uses primarily coniferous or mixed-wood habitats. Optimum Fisher habitat consists of a diversity of forest types and, therefore, greater prey abundance. Large diameter trees with cavities (optimal den sites) found in the ravines and lower lying areas were not within the Project's topographical boundary line above 275m ASL. Fishers move to larger cavities as the young grow. Dense forest stands in the latter successional stages provide the best quality habitat, particularly in western North America. It is vulnerable to habitat loss through forestry, trapping and hydroelectric development. Loss of habitat through the cutting of forests for timber or conversion to other land uses, over-trapping and the widespread use of poisons as a harvest and predator control method have also contributed to the reduction and extirpation of Fisher populations in Nova Scotia. The Fisher prefers high canopy habitats that may only be found in the ravines and lower regions of Dalhousie Mountain but was not seen during any of the expert studies over the last three years.

- Mainland Moose has been recorded up to the 1970s. Studies and research carried out indicate Dalhousie Mountain has a declining natural habitat for supporting moose and there have been no known sightings for many years. DNR in MacLellan's Brook was contacted and interviews with many individuals indicate the same, no sightings. See Ross Hall's biologist study and 3 letters from landowners (see Appendix C3).

Invertebrates

- The Early Hairstreak, the Hoary Comma, the Greenstripped Darner and the Satyr Anglewing

Reptiles

- Wood Turtle shows up on the 100km radius search from ACCDC. Through conversations about the project boundaries with Ross Hall Biologist, Doug Archibald Biologist and NSDNR field personnel, indicate no natural habitat for the Wood Turtle exists and is very unlikely to be seen in the area.

Plants

Seven of the 94 pre-identified potential rare plant species were found on the site and two additional rare plant species were also found:

- Round-Leaf Hepatica - Hepatica nobilis var. obtusa (S1, May be at-risk)
- Squashberry - Viburnum edule (S2, Sensitive)
- Early Coralroot - Corallorhiza trifida (S3, Secure)
- Broad-Leaved Twayblade - Listera convallarioides (S3, Secure)
- Tall Millet-Grass - Milium effusum var. cisatlanticum (S3, Secure)
- Dwarf Ginseng - Panax trifolius (S3, Secure). *If this level of abundance (which is not known in other regions of the Maritimes) is general across the eastern part of the Cobequid Mountains, this species' S-rank should be revised to S4(Blaney 207)*
- Large Roundleaf Orchid - Platanthera orbiculata (S3, Secure*) **The possibility of the plant being Larger Roundleaf Orchid (P. macrophylla – S2, Sensitive) cannot be ruled out. Its unspecialized habitat and wide distribution make it a candidate for a future ranking revision to S4 that would remove it from the AC CDC tracking list.(Blaney 2007)*
- Red Trillium - Trillium erectum (S3, Secure)*, it is a strong candidate for ranking revision to S4, which would remove it from the AC CDC tracking list (Blaney2007).*
- Holly-Fern - Polystichum braunii (S3S4, Secure)

The following components have been considered in the interaction with Species at Risk, Wildlife and their Habitats.

Boundaries

The Boundaries searched and considered were broad due to the uncertainty of travel distances of some of the species; however, the spatial boundaries relate both to the footprint that will be disturbed and a greater area that may provide habitat for the listed species.

Access Roads

The locations of access roads have been selected to minimize potential impacts on wildlife and Species at Risk. A vegetation survey of the selected routes has been conducted which confirms that plant species of concern have been avoided. The installation of culverts offers potential impacts on the aquatic environment which will be controlled using proper culvert design and installation measures following Provincial guidelines. The work will be conducted during the dry season to minimize risk to aquatic

receptors. The noise and human activity associated with road construction will cause some species to leave or avoid the areas of disturbance. Typically, these species will re-acclimate to site once the construction phase is complete.

During the operations phase, turbine sites will be subject to routine maintenance calls and inspections. The vehicles will travel over the access roads to the turbine sites. These activities will be relatively infrequent compared to other site activities associated with tree harvesting and recreational usage by ATVs and snowmobiles. It is unlikely that the site activities during the operations phase of the project will add significantly to the potential impacts of human activities on the wildlife within the project area.

Project Construction

The following sections address separately the likely impacts that construction could pose on each of the species groupings identified above:

1. **Fisher**:
   Fisher has not been sited by any members of the expert study team while conducting their respective searches. Although known to breed in the County, they also avoid contact with humans. If the Fisher is present in the vicinity of the turbines, they could, be affected during construction either directly or indirectly. Direct affects of such as land clearing operations are unlikely as the animals will avoid areas of human activity and noise. Indirectly impacts could occur by a reduction in the quality and quantity of their habitat. Since the turbine footprints are under 2% land use, the loss of productive habitat is considered minimal.

2. **Monarch Butterfly**:
   Monarch Butterfly require habitat where milkweed is found. No milkweed was identified on or in the vicinity of the turbines sites. Therefore, the removal of the vegetation in these areas will have no impact on the habitat preferred by the Monarch Butterfly.

3. **Wood Turtle**:
   Suitable habitat does not exist for Wood Turtles within the project area. It is unlikely that project activities will encounter or impact this species.

4. **Mainland Moose**:
   It has been determined that the Mainland Moose population no longer resides in the vicinity of the Project; however, the Mainland Moose Recovery Program implemented by NSDNR describes the area as a suitable habitat for recovery. The project will not change the potential habitat for moose. Moose would almost certainly avoid the area during construction because of the disturbance caused by construction and human activity. Once the construction has been completed and the turbines are operational, the project offers no significant impediment to the re–habituation to the area by moose.

5. **Round-Leaf Hepatica**:
   The presence of Round-Leaf Hepatica was discovered between Turbine 13 and 20. This area and a buffer zone have been flagged and the potential disturbance of the area will avoided during road and other construction activities.

6. **Squashberry**:
   The presence of Squashberry was discovered between Turbine 16 and 23. This area and a buffer zone have been flagged and the potential disturbance of the area will avoided during road and other construction activities.

Overall, no significant effect on Species at Risk and Wildlife is predicted due to proper mitigation methods and work habits.

Project Decommissioning

The decommissioning of the Project would involve the dismantling and removal of the turbines. Effects on the species identified, if any, would be comparable to, but less than that associated with construction. In summary, the decommissioning of the Project site will not result in a significant adverse environmental effect on species of concern.

Overall, no significant effect on Species at Risk is predicted due to proper mitigation methods and work habits.

Mitigation

Efforts have been made to ensure that the Project is sited on previously cleared lands and not in natural areas. However, limited clearing of trees will be required to facilitate the installation of several turbines and ancillary facilities such as the access roads and collector lines. From the floristic and vegetation point of view, the study area contains few constraints for wind power development since the preferred locations for turbines are exposed, mostly previously cleared areas and typically upland vegetation units. The properties are almost all previously deforested or scheduled to be deforested in the near future or consist of unused agricultural and/or rural land. However, prior to construction, the limits of vegetation clearing will be staked in the field. The Construction Contractor will ensure that no construction disturbance occurs beyond the staked limits and that edges of woodlots and other sensitive areas (Rare Plants identified in Sean Blaney's Study) adjacent to the work areas are not disturbed.

Malfunctions and Accidents

During the operation of the wind farm, malfunctions are most likely to involve the stoppage of turbines due to a mechanical problem, or electrical failure such as a break in a power line or cable. The turbines and electrical systems have built-in safety features which shut down the systems and avoid significant damages to the systems and equipment. There are limited quantities of lubricants present in the turbines. Given the very limited footprint that would likely be involved in such an event, no significant adverse impact on the identified species of concern is predicted.

Cumulative Assessment

There are no proposed new works known that will take place in, or in the vicinity of, the turbine sites that might act cumulatively with the construction, operation or decommissioning of the proposed turbines to cause a significant adverse effect on the identified species of concern.

Sustainable Use of Renewable Resources

The project area falls within a region of high wind energy in the province. The generation of electricity at Dalhousie Mountain offers a sustainable source of renewable energy to supplement the province's power demands. This project does not conflict with the present use of the land for other renewable resources principally forest products.

Residual Environmental Impact

Though the effects are anticipated to be minimal, there is some potential for disturbance of natural features, habitats, and species during construction phase of the Project. However, these effects are expected to be short-term in duration and spatially limited to the work areas and immediately adjacent areas. Studies related to the sensory effects of constructing and operating wind farms on big game resources, carried out in the Western U.S., have shown that there is no significant effect (Strickland and Erickson, 2003). These studies indicate that species are either unaffected by this type of development, given their small footprint and preservation of the existing land-use, or that they can readily adapt to the presence of the wind farm. Once the Project is operating, activity around the facilities will decrease, thus allowing local flora and fauna and wildlife movement patterns to re-establish. Disturbance to local flora, though permanent, will be spatially restricted to the operating areas. The effect of installing the various Project components is anticipated to have limited effect on the Species at Risk, wildlife, and their habitats during construction or operation of the facilities. Based upon the implementation of the protective and mitigating measures coupled with the Project's siting activities, no net loss of wetland functions are anticipated as a result of the Project's construction or operation and maintenance activities. Considering the temporary nature of construction effects, the limited extent of permanent works, and the periodic nature of maintenance activities, it is likely that resident wildlife will adapt to the Project. Overall, no significant negative net effects are anticipated to Species at Risk, wildlife, and their habitats given that the Project is generally sited in areas already cleared for forestry use and away from any sensitive environmental areas such as wetlands. Impacts associated with increased accessibility by humans cannot be ruled out.

The level of impact, after mitigation measures are implemented, is rated as "**low**", (i.e.; a slight decline in resource over life of project).

5.2.4 Avian Species (Birds including Migratory Birds)

The habitat use by breeding birds, migratory birds, and winter residents was assessed over several years by Sean Blaney (2005), Dan Busby (2005/06/07) and Steve Vines

(2007/2008). In Appendix C4, 5, 6, and AS:5**,** Sean Blaney's field work and the Dalhousie Mountain Bird Study by Steve Vines offer the results of the surveys of avian species. These surveys were conducted with advice received from the Canadian Wildlife Service (CWS) of Environment Canada and the guidelines outlined in the CWS document, *Wind Turbines and Birds: A Guidance Document for Environmental Assessment* (April 2007).

Information relevant to bird populations, bird habitat, and the possible impact of wind turbines was gathered from a variety of sources, including:

1. Federal and provincial government agencies;
2. Conservation Data Centres;
3. Websites on species at risk, bird conservation regions, and important bird areas;
4. Pre-existing surveys of the site and adjacent areas, including the Maritime Breeding Bird Atlas, the Maritime Nest Records Scheme, the Maritimes Breeding Bird Survey, Project Feeder Watch, and the Christmas Bird Count;
5. Interviews with local birders; and
6. Environment Canada weather data.

Dan Busby, CWS, was contacted early in the study and planning phases and determined the Project is not on a major migratory bird flyway (see Appendix C6) according to CWS. There are also no recorded abundance of migrating peregrine Falcons within the 10 km Boundary radius from turbine P1-11 which is considered the centre point of the Wind Farm.

Steve Vines conducted a study of migrating birds, breeding and wintering birds from February 2007–July, 2008. One species found on the mountain, the olive-sided flycatcher, is listed as “threatened” by the Committee on the Status of Endangered Wildlife in Canada and has “yellow” or sensitive status with the NS Department of Natural Resources. This species utilizes burns, bogs and clearcuts regenerating with softwood or mixed wood tree species. These habitats are abundant lower on the mountain. The turbines will be erected on higher sites. Cornell University research staff suggests that their population decline may be associated with wintering sites to the south.

Two other species were found that are designated as “yellow” or sensitive by the NS Department of Natural Resources. They are the Gray jay and the Boreal chickadee. These species frequent the boreal forests of the north, and similar softwood forests in Nova Scotia. Research has shown that Gray Jays are suffering during mild winters because the food they cache as winter supplies spoils. That renders them in poor condition for the breeding season. The forests that support these species tend to be disturbance forests that have been repeatedly logged at lower elevations on Dalhousie Mountain. The turbine sites are located above such habitats.

No staging areas for shorebirds, waterfowl or land birds were noted. Details on the reconnaissance methodologies and results of the spring, summer, autumn, and winter desk top studies, point counts and migration and breeding bird studies are provided in Appendix C4, 5, 6 and AS: 5.

Findings (from S. Vines 2007/2008)

1. No breeding bird colonies are present in the study area;
2. The study area does support small breeding populations of olive-sided flycatchers, gray jays and boreal chickadees that are listed as sensitive at lower elevations on Dalhousie Mountain. The turbines are located at the highest elevations, above these habitats;
3. There do not appear to be landforms in the study area that concentrate migrating birds;
4. The study area is not of unusual importance to migrating raptor species;
5. Numbers and species of migrating birds counted during the fall season are representative of what one would expect to encounter in similar habitat types in this region of Nova Scotia.

Boundaries and Environmental Setting

The spatial boundaries encompass the entirety of the area where the turbines are being located and extend to include those areas that are frequented by birds that may be impacted by the construction or operation of the turbines. The temporal boundaries encompass both the construction phase and the operation of the turbines.

Access Roads

There are several routes for construction and operation of the Project that could impact the bird population of the area while constructing the towers, creating loss of habitat and interference with normal behaviour such as feeding and breeding.

Project Construction

Construction activities, such as clearing, grading and turbine assembly can result in the temporary disturbance of birds due to noise and the presence of humans in the area. Construction activities which may pose a risk to the bird population in the project area will be monitored and the timing of such activities scheduled to minimize potential impacts.

All the breeding birds found, including the raptor, are common throughout the province and therefore, the project poses little risk to species of concern. Given the existence and use of access roads to the turbine locations, habitat disturbance may result which will affect at most one or two territories of any given species. No raptor nest sites were found that would be disturbed.

It is unlikely the Project will result in a significant adverse environmental effect on avian population of the province, including species of concern, from the construction of the proposed project.

Project Operation

Several facets of turbine operation may affect bird populations at wind farms. These are: noise and rotor movement associated with the turbine operations; aeronautical lighting, loss of habitat; presence of large moving rotors. These features may result in: an interruption in regular behaviour such as feeding, migrating and breeding; displacement to avoid disturbance, disorientation during flight and collisions with turbine blades. An increasing number of studies, both by independent academic researchers and the wind industry, indicate that mortality from wind turbines vary, but are generally very low and much lower than urban areas with large lighted buildings.

Raptors can be susceptible to collisions with rotor blades. No raptor nests were found within 2 km of the proposed turbine sites. The proximity of nests and hence the use of the area will likely vary from year to year. Nevertheless, based on the conditions, on what is known and the number of turbines, the number of collisions that might be expected is low. The effect of collisions on local foraging birds, including raptor populations, is not considered to be significant and unlikely to impact any species of concern in the province.

In summary, although there is always a risk of disturbance and collision associated with the operation of turbines, there is unlikely to be a significant adverse effect on the avian population of the province, including species of concern, from the operation of the proposed project.

Project Decommissioning

The decommissioning of the Project would involve the dismantling and removal of the turbines. Effects on the bird population, if any, would be comparable to those experienced during Project construction.

It is unlikely the Project will result in a significant adverse environmental effect on avian population of the province, including species of concern, from the decommissioning of the proposed project.

Mitigation

The indirect effects arising from the removal, fragmentation, or disturbance of habitat during the Project's construction phase has a larger potential to negatively affect birds or bats than the direct mortality from turbine collisions. However, since bird habitat requirements during migration are much less specific than during the breeding season, limited habitat removal and disturbance is expected to have an insignificant effect on migratory birds. The removal and fragmentation of natural habitats, especially wetlands and woodlands, has been minimized by avoiding construction in or across any

noticeably sized natural habitats. The study area does not support significant numbers of migratory birds or bats and no other species at risk were detected. The study area, although not entirely devoid of natural habitat, has been largely altered for forestry purposes and provides mostly lower quality bird habitat. The design (e.g. turbine shape and lighting) and siting process (e.g. outside of flyways) inherent in the project, mitigates many of the potential direct and indirect effects of the Project.

Additionally, habitat requirements for birds during migration are much less stringent than for breeding species and limited habitat disruption will have a negligible effect on migrating birds. The main, direct effect of the proposed undertaking on birds is mortality due to collision with turbines during operation. Background information reviewed and field studies have demonstrated that the study area is not in the path of a major migratory flyway, that it does not contain any topographical or other physical features that would concentrate birds, that it does not provide habitat for breeding species at risk, and that it supports generally lower-quality agricultural habitat. These factors lead to the conclusion that the potential for direct avian mortality at the Project is very limited.

The study area meets the general and specific siting guidelines for onshore facilities suggested by Bird Studies Canada, 2003 (BSC). BSC (2003) notes that "the greatest adverse effect that wind energy facilities have on birds is disturbance to breeding and wintering birds (except in areas where poor habitat quality exists, such as forestry, agricultural and industrial areas)" can proceed with little or no pre-construction monitoring". For example, bird mortality at a site in southern Ontario, also outside of major flyways, has been demonstrated to be less than two birds per turbine per year. This number is negligible compared to the number of individuals that pass through southern Ontario and, this Project would not have an appreciable effect on local or regional populations in Nova Scotia. However, a bird monitoring program has been established for a 2 year period following commissioning.

Malfunctions and Accidents

During the operation of the wind farm, malfunctions are most likely to involve the stoppage of turbines due to a mechanical problem, or electrical failure such as a break in a power line or cable. The turbines and electrical systems have built-in safety features which shut down the systems and avoid significant damages to the systems and equipment. There are limited quantities of lubricants present in the turbines. Given the very limited footprint that would likely be involved in such an event, no significant adverse impact on the avian species is predicted.

Cumulative Assessment

There are no proposed new works known that will take place in, or in the vicinity of, the turbine sites that might act cumulatively with the construction, operation or decommissioning of the proposed turbines to cause a significant adverse effect on the identified species of concern.

Sustainable Use of Renewable Resources

The project area falls within a region of high wind energy in the province. The generation of electricity at Dalhousie Mountain offers a sustainable source of renewable energy to supplement the province's power demands. This project does not conflict with the present use of the land for other renewable resources principally forest products.

Residual Environmental Impact

The effect of installing the various Project components is anticipated to have limited effect on birds and bats during construction or operation of the facilities. Given that the Project is generally sited in areas already cleared for forestry use, the study area does not support significant numbers of bats or birds and is not on major migratory flyway. No significant negative net effects are anticipated to birds, their habitat or staging areas.

The level of impact after protection and mitigation measures have been employed is rated as "low" (i.e., slight decline in resource over life of project).

5.2.5 Existing Land Use

The Dalhousie Settlement area was the last settled area in Pictou County in the 1800s. The land was cleared for farms, a school, a post office and a few saw mills that comprised the settlers' small community. The conditions were harsh, the winters long and poor soil productivity for farming crops, were the main reasons the farms were abandoned. The Canada Land Inventory, Soil Classification for Agriculture shows Dalhousie Mountain as being "Class 7" which does not support arable culture or permanent pasture. Most residents left in the early 1900s and the last settler left by horse and wagon in 1941, moving to Eureka. Over the years, Dalhousie has been over-grown with mostly Spruce, Fir, Poplar, and Maple. In 1990, thousands of acres were cleared and either replanted with Norway/White Spruce or left to naturally regenerate in Balsam Fir (Christmas Trees).

RMSenergy has consulted with the Municipality to address issues of compatibility with permitting requirements and compliance with Municipal by-laws and regulations regarding boundaries and adjacent land owners. The following is a summary of these consultations and compliance issues:

- The Municipality of the County of Pictou has adopted a municipal by-law governing the setback distances of commercial sized wind turbines relative to different marking criteria. These distances are:
  - 300m from a government maintained road;
  - 600m from a dwelling;
  - turbine height with blade in vertical position as the distance a turbine must be away from outer property boundaries within the project area.

  Due to the size of the wind farm relative to the typical size of land parcels in the rural setting of Pictou County, the Council decided to allow internal property lines to be invisible for the purpose of setbacks.

- If the turbines in the wind farm fall within these criteria, the permitting process requires an application to the municipal planner for a development permit for each turbine location.
- Where the project layout cannot meet the setback criteria, the developer has the option to apply to the adjacent landowner, as well as the municipal council, for a 'variance'. This process is more time consuming than the straight forward approach of permit application within by-law regulations, but it does ensure the developer some room to adjust positioning of some turbines which may be necessary for any number of reasons.

RMSenergy has had numerous meetings, conversations and emails with various council members and employees of the planning department regarding these issues and are fully confident in their knowledge of the permitting process for wind turbines in Pictou County.

When siting the turbines, the by-law distances have been used by RMSenergy as a starting point for exclusion zones. As stated throughout this Environmental Assessment, RMSenergy has conducted each expert study in a manner through which the turbines may be adjusted within a 75m radius of the given coordinates. When final micro-siting is complete, the development permits will be applied for by RMSenergy to the Municipality of the County of Pictou.

Boundaries

The affect on land use will be concentrated on the individual turbine sites, 0.2 ha, during construction reduced to 0.1 ha during the operation and on the easement (spacing 500 m x 20 m wide easement) between turbines which is 1 ha during construction reduced during running operations to 0.5 ha.

Access Roads

Access roads could adversely affect existing land use from any activity that would temporarily inhibit access to Glenn Road, Old Dalhousie Settlement Road, The High Road and lands accessed by these roads. Access roads may temporarily remove lands from other uses (forestry)

Project Construction

The affect on land use will be primarily temporary access loss/disruption during the construction of the turbines which will involve the delivery of up to 400 large loads. These deliveries may slow or interrupt traffic on the Trans Canada Highway at Exits #18a and #19 and onto the Highway #4 before turning onto Glen Road and or the driveway of S.W. Weeks Ltd. However, at no time will the private landowners be unreasonably prevented from gaining access to their land.

The sites are located in remote areas and the existing land uses are compatible with this type of construction. Most roads and private operations on Dalhousie Mountain have

site access from 4 or 5 different directions. Over 40 roads and trails currently exist on the privately owned lands which connect all the different land parcels.

No significant affect on land use is predicted due proper to mitigation methods and work habits.

Project Operation

Property owners will derive additional income from lease agreements for easements for access roads and turbine sites. This is considered a positive impact on land of limited capacity for alternative development. The Municipality which devises its revenue from land use based taxation will benefit from this project.

The daily operations of the wind farm are considered to have a minimal impact on land use. Scheduled and unscheduled maintenance will occur that may affect snowmobile trails if plowed in the winter months. The land is currently in use for logging and is privately owned. The landowners will carry out their respective activities as usual, unimpeded by the Project and once the turbines are in place there will be no further impact on land use.

A positive affect on land use is predicted due to revenues derived from leases and taxes.

Project Decommissioning

Decommissioning land use will use the same footprint as in the operation phase. The process is much simpler due to the process of disassembling the components and placing them directly onto flatbed trucks for removal without requiring storage areas.

No significant affect on land use is predicted due proper to mitigation methods and work habits.

Malfunctions and Accidents

During access to land the potential for vehicles may come in contact or attempt to come too close to: delivery; unloading operations; cranes; electrical works; and even in extreme weather or turbine damage situations which could pose a threat to anyone attempting access to existing land use.

Mitigation

Mitigation procedures to reduce the impact of all phases of the project concerning existing land use will be practiced. Some of the measures are: minimizing the width of roads to a 5 m surface; knowing and understanding the timing of traffic: knowing the timing of access to the Sugar Maple bush by the landowner; and to clear the trees for easements during winter months when the ground is frozen.

Cumulative Assessment

The cumulative effect on existing land use will be the addition of roads and removal of trees for the purpose of site access and turbine operation. On average, there is 1 turbine for every 80 ha of land within the property line boundaries which equals 1.63 % of land use that will be required for construction, reduced to less than 1% of land use during operation. There are over 40 existing roads and trails in various states of repair on Dalhousie Mountain. With the addition of new roads which are smooth and gravelled, many of the old roads will eventually fall into disuse and become overgrown. Effectively road system fragmentation will be reduced and the impact from vehicular traffic may be reduced (i.e. silt run-off and ruts left in mud roads). The entire area is currently accessible by cars, trucks, SUVs, ATVs, and snowmobiles using existing access roads from the north, south, east and west.

Sustainable Use of Renewable Resources

The existing land uses include forestry, blueberries, and a Sugar Maple bush all located on the land held under agreement by the Proponent. Working closely with the landowners has resulted in turbines being located in deforested, unused land where possible. This project does not conflict with the present use of the land for other renewable resources principally forest products.

Residual Environmental Impact

Based on the assessment criteria from Table 5-2, the impact is on Land Use is predicted as “minimal” (i.e. the resource should return to baseline levels).

5.2.6 Air Quality

Compared to the use of combustion technology, the generation of wind power is a zero emission way to create electricity. “Green power” in Nova Scotia is absolutely necessary to offset the huge appetite for household consumption when compared per capita to other provinces and countries. Currently about 90% of Nova Scotia’s electricity comes from the combustion of non-renewable resources such as coal, oil, petroleum hydrocarbons, or other fossil fuels. The emissions generated are being released into the air effecting air quality for plants, wildlife, aquatic life and humans. These GHGs are affecting the Province’s natural balance and leading to global climate change. The addition of this Project follows the objectives of government to reduce these types of emissions and will have a net positive effect on air quality.

The level of dust and vehicle contaminants during construction and operation will be kept to a minimum as described in Section 5 under Mitigation.

Boundaries

No air quality concerns exist in the area surrounding the Project site. Wind farms also differ substantially from most other electrical generation facilities as they do not use a

combustion process and therefore do not produce any air emissions. Dust and vehicle emissions may occur during project construction, similar to logging operations.

Access Roads

As indicated above, dust and emissions in the immediate vicinity of the proposed works during construction may be of some concern.

Project Construction

During construction minor, localized air emissions will occur from operating heavy equipment and temporary operation of generator sets. Additionally, construction related traffic and various construction activities (e.g. excavation, grading, and exposed areas) have the potential to create short-term nuisance dust effects in the immediate vicinity of the Project.

No significant effect on Air Quality is predicted during the construction phase of the project due to proper mitigation methods and work habits.

Project Operation

During operations, localized air emissions will occur from service vehicles and road maintenance equipment. These events will be short term and temporary. There will be no air emissions from the operation of the turbines.

No significant effect on Air Quality is predicted due to the generating system.

Project Decommissioning

Decommissioning of the Project will involve the dismantling of the turbines and removal of power-lines, dust and emissions are similar to Project construction and will be minimal, if any, effects on air quality.

No significant effect on Air Quality is predicted due to proper mitigation methods and work habits.

Malfunctions and Accidents

Fire from electrical components has the potential to create air pollution. This is a highly unlikely event. Discussions with the Fire Chief at West River Fire Hall have determined the safe distances for personnel and routes to each turbine indicated on a map which will be posted in the fire hall prior to commissioning.

Mitigation

To protect adjacent receptors from potential offsite dust concerns good site practices during construction will be implemented including:

- Maintaining equipment in good running condition and in compliance with regulatory requirements;

- Protecting stockpiles of friable material with a barrier or windscreen. In the event of dry conditions and excessive dust, dust suppression (e.g., water and/or calcium chloride sprayed on the road surfaces) and covering loads of loose materials during transport;
- In terms of emissions from combustion engines, all construction equipment will be maintained in good working order to minimize emissions. This will assist in minimizing the Project's short-term contributions of greenhouse gases, odour, and other airborne pollutants.

For the operation of the wind farm, no special protective or mitigating measures have been identified. In fact the operation of the Project will result in a net reduction GHG, from the offset of fossil fuel generation.

Cumulative Assessment

Dust is the main concern associated with the construction and operation of the Project that could have an adverse impact on air quality. These effects are primarily associated with construction and are localized to the Project site. The proposed Project will not act cumulatively with any other activities taking place in the area to cause a cumulative effect on air quality.

Sustainable Use of Renewable Resources

N/A

Residual Environmental Impact

The effect of installing the various Project components is anticipated to have no long-term effect on the air quality of the local air quality either during construction or operation of the facilities. The rational for project is to improve air quality in the future by reducing the generation of greenhouse gases.

The Project is not anticipated to have a significant residual effect on Air Quality and therefore; the impact is predicted to be "minimal" (i.e. the resource should return to baseline levels).

5.2.7 Environmental Noise

A noise study was completed using Wind Pro software to predict the decibel rating at the residences within 2 KM of the nearest turbines. The layout has since been changed, moving the 4 turbines that were close to residences (890m) to a distance of 1.5 km. The Municipality of Pictou County considered that noise a major issue when setting the 600m setback from residences in the 2007 bylaw. Due to the large distance from a few homes, this Project is designed primarily to avoid homes. A notice of 3 public meetings to all residents within 3 km was delivered to mailboxes and there have been no concerned comments submitted to the Proponent (see Appendix C2).

The primary benefit from the standpoint of noise generated at the Dalhousie Mountain Wind Farms is the setback distance and minimal population near turbine locations. Turbines 28, 4, 5 and 46 were the turbines closest to any existing residences; these 4 turbines were 800+ metres from several homes and were the source of the highest predicted noise identified in Table 5.3, all turbine locations have been entered into the study for cumulative noise issues. These residences are located on the south side of Lower Mount Thom on Brookland Road, Back Road and one home on McGilivary Road. A preliminary noise study by DEWI GMBH using a computer generated model for the GPS locations of the closest residences in the area was carried out using maximum noise levels for the GE 1.5 sle at maximum wind worst case scenario. The full report in Appendix C1 was calculated using the software WindPro 2.5 according to ISO 9613-2 (1) the international standard for these kind of calculations. The calculation results for the 17 residences identified by the client as being within 2 km of a turbine are shown in Table 5.3 with the detailed results for every turbine in Chapter 4.2 of the full report (see Appendix C1). A topographical map is provided in Fig. 5.1 to identify the calculated noise (dB), the receptor points (houses) and turbine locations.

Since this study was performed, the Proponent felt the best way to mitigate the issue of noise was to voluntarily move all turbines to a distance of 1500m or greater.

Table 5.3: Calculated Noise and Distance from Residences

House ID#	UTM Easting	UTM Northing	House ASL (M)	Receptor Height(M)	Calculated Result(dB) Maximum	Nearest Turbine#	Turbine Distance
1	503’000	5’041’600	198	5	32.9	# 28	1744 m
2	503’500	5’041’700	191	5	34.4	# 28	1396 m
3	503’300	5’042’300	240	5	37.4	# 28	1027 m
4	503’700	5’041’600	186	5	34.2	# 28	1421 m
5	504’100	5’041’700	209	5	35.1	# 28	1270 m
6	504’300	5’041’900	217	5	36.4	# 28	1092 m
7	504’400	5’042’000	214	5	37	# 28	1021 m
8	504’800	5’042’400	202	5	38.5	# 28	919 m
9	505’300	5’043’200	190	5	40.7	# 46	814 m
10	505’400	5’043’700	167	5	39.3	# 5	1007 m
11	505’300	5’043’800	169	5	40.2	# 5	879 m
12	505’400	5’043’900	158	5	39.5	# 5	952 m
13	505’500	5’044’200	150	5	38.8	# 5	1045 m
14	505’600	5’044’400	140	5	38.2	# 5	1184 m
15	504’400	5’045’000	118	5	39.2	# 5	1320 m
16	505’400	5’045’100	116	5	39.3	# 5	1392 m
17	505’600	5’045’300	114	5	38.6	# 7	1508 m

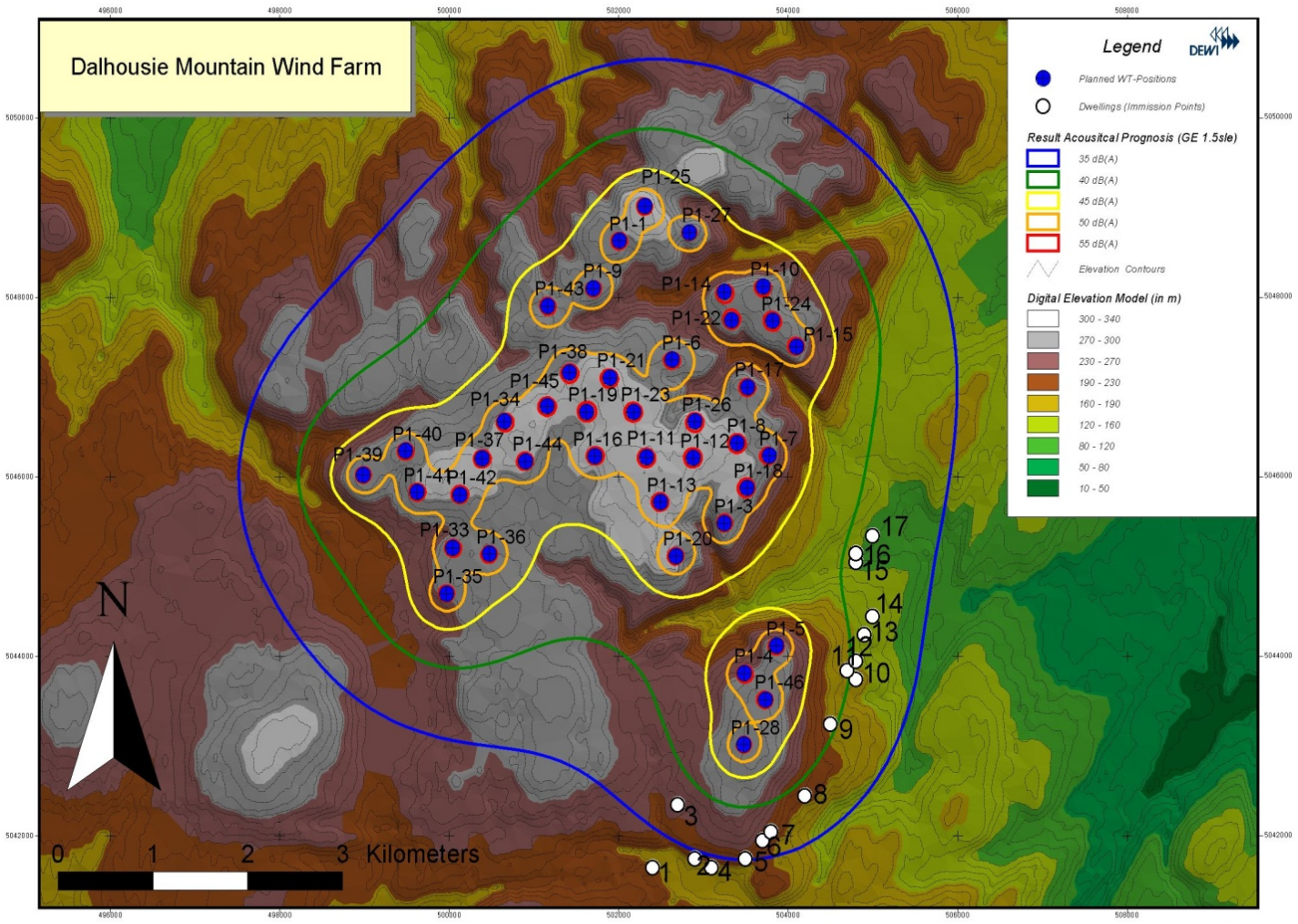


Fig. 5.1: Calculated Sound Levels (dB) at Receptor Points (houses) with Initial Turbine Locations

Boundaries

The study boundary is 2 km from a turbine to an occupied residence. The closest residence was 814 m from turbine 46. With the changes in the layout since the noise study was performed, the closest residence is now greater than 1500 m. Turbines 5, 4, 46, 28, have been relocated to the west below turbines 35 and 36 greatly reducing the impact to the 17 homes.

Access Roads

An increase in noise activities along the roads is primarily of concern during construction, with a slight increase in traffic to service the turbines during the operational phase.

Project Construction

During construction, noise will be generated by the operation of heavy equipment at each of the work areas and associated vehicular traffic on-site. The audible noise at receptors beyond the construction area is expected to be a minor, short-term disruption consistent with noise generated by any industrial construction project.

No significant effect on Environmental Noise is predicted due to proper mitigation methods and work habits.

Project Operation

During operations there is potential for limited off-site environmental noise effects from mechanical and aerodynamic noise emitted from the wind turbines. The data indicate that the turbines are located at sufficient distances from adjacent residents so as not to create significant noise impacts.

No significant effect on Environmental Noise is predicted due to proper mitigation through the siting of turbines away from adjacent residents.

Project Decommissioning

During construction noise will be generated by the operation of heavy equipment at each of the work areas and associated vehicular traffic on-site. The audible noise at receptors beyond the construction areas is expected to be a minor, short-term disruption consistent with noise generated by any industrial construction project.

No significant effect on Environmental Noise is predicted due to proper mitigation methods and work habits.

Mitigation

It is generally accepted that construction activities will result in short term environmental noise effects. To minimize inconvenience brought on by excessive noise during the construction phase of the Project, all engines associated with construction equipment will be equipped with mufflers and/or silencers in accordance with DOT guidelines and regulations. Noise levels arising from equipment will also be compliant with sound levels established by the NSDEL. To the greatest extent possible, construction activities that could create excessive noise will be restricted to daylight hours and adhere to any local noise by-law(s).

During operation, the Project will be a source of noise emissions. The primary mitigation tool was locating the turbines at a minimum distance of 800 m from a residence; however, the layout has since been changed from the initial design resulting in a distance from the nearest turbine of over 1500 m.

Propagation of environmental noise emissions from the Project to Points of Reception was modelled using ISO 9613 noise propagation algorithms. This ISO model can

account for distance, ground, and atmospheric attenuation, meteorological effects, source directivity, and acoustical screening. Among other factors, the noise levels guaranteed by GE, were found to be within the acceptable limits at all critical Points of Reception within 2,000 m of one or more turbines for wind speeds of 6, 7, 8, 9, 10, and 11 m/s. Consequently, it is probable that for select cases where there are trees or shrubs in the propagation path between a turbine and a Point of Reception, such that the line of sight is blocked by the foliage, there will be resulting attenuation that has not been accounted for in the modelling. Thus, the values calculated for sound attenuation are likely to be conservative in areas where there is foliage present in the line of sight between any turbine and a Point of Reception. Insulation will be installed in the nacelle surrounding the generator and gearbox to reduce the noise levels as a further precaution.

As an additional precautionary measure for the mitigation of sound levels at residences, RMSenergy has moved several turbines to more than 1500 m from homes even though the Municipality setback is 600 m. It is worth mentioning that excellent sites do exist much closer to homes and the economic benefits would be attractive; however, to balance community support with a successful wind farm, the Proponent decided that a larger setback would foster better relationships until more accurate sound predictions can be made and the community has experience with the operation of the site.

For practical purposes, the turbines would be inaudible at 1500 m to a dB sound measuring device; therefore, it is impractical to attempt any kind of ambient noise study when the Proponent is using such large voluntary setbacks. Figure 5.2 shows the turbines that have been removed to allow a setback of 1500m from the nearest residence. This figure is intended to show the current scenario against the worst case scenario of 45 turbines, some being located as close as 800m to residences.

Studies have been performed at several other wind farms where the turbines are at distances greater than 1500m and the results were inconclusive due to the inability to determine whether the sources of ambient noises were leaves, turbines, traffic etc. The Trans Canada Highway which is between 500m and 1500m from the listed residences will provide additional noise levels. The 1500m setback chosen by the proponent is intended to mitigate potential the addition to this and other background sound sources which might have a combined effect on noise levels under certain wind conditions. .

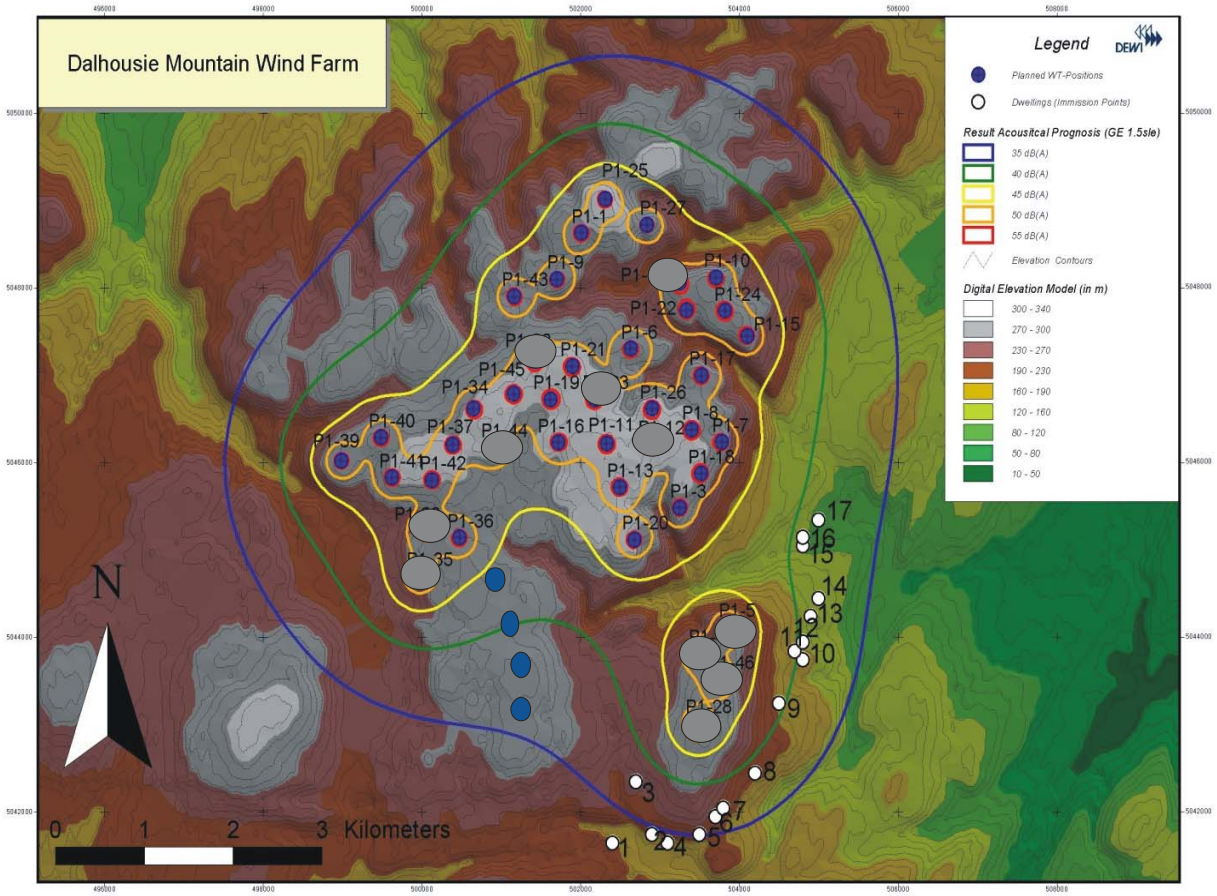
Cumulative Assessment

The other sources of existing environmental noise are chainsaws, snowmobiles, ATVs, gravel trucks from the large rock quarry, and vehicle noise from the nearby Trans Canada Highway. The Trans Canada Highway is approximately 1 km from most homes and is certainly closer to all of the homes in the Lower Mount Thom and Brookland areas than the wind turbines. It is predicted the wind farm will not compound noise levels when combined with existing noise due to the large setback of more than 1500 m.

Residual Environmental Impact

The effect of installing the various project components is anticipated to have a limited effect on the environmental noise conditions of the study area during construction or operation of the facilities. The level of impact after protection and mitigation measures have been employed is rated as low (i.e., slight decline in resource over life of project) since a new source of environmental noise has been added in the study area. However, on the basis of the model results, no significant negative net effects are anticipated to environmental noise conditions, as mentioned in mitigation, the primary tool to avoid unfavourable interaction with residents was to locate the turbines at a voluntary distance of 1500 m (the Municipal setback is 600 m).

Modified Noise Study Map to demonstrate mitigation by moving 4 Of the closest Turbines to a distance of over 1500m removing 7 Turbines which are not required for the 51 mw Project



Turbine locations removed as reflected in Figure 1.1 to identify 34 out of a potential 43 locations that were Studied for VEC's

Turbines 5, 4, 46, 28, moved away from Receptors to over 1500 m

See Table 2.6.1 for exact co-ordinates

Figure 5.2: Calculated Sound Levels (dB) with Receptor Points (houses) 1500m from Turbine Locations

Based on Table 5-2 with a setback of 1500 m, the residual environmental impact is predicted to be "low" (i.e. slight decline in resource over life of project).

5.2.8 Bats

A desk top study on the presence of bats in the project area was conducted: Conversations with government experts early in the planning stages expressed a concern that this was an unknown area for Bat Habitat and it was suggested that recordings be made during the bat migration period. The field study was conducted which determined that the numbers of migrating species appeared to be lower than normal and the species identified were expected. It also appears that bats typically forage below the levels of the turbine blades.

It is important to Nova Scotia's natural environment that wind turbines are installed in areas that typically do not provide a natural habitat or vital feeding ground and importance to the survival of all Bat Species whether listed as a species of risk or not. Dalhousie Mountain has a minimal interaction with bat species compared to many other regions of the Province (see Appendix C7).

Boundaries

The spatial boundaries encompass the entirety of the area where the turbines are being located and extend to include those areas that are frequented by bats that may be impacted by construction activities or operation of the turbines. The temporal boundaries encompass both the construction phase and the operation of the turbines.

Access Roads

The installation of access roads may displace habitat used by bats. The area of the access road corridor is limited and therefore this habitat loss will be small. Given the potential loss of habitat associated with forestry in the area, the incremental loss of habitat not is considered significant to the bat population of the area.

Project Construction

If bats are present in the vicinity of the turbines, their numbers are likely to be low. During construction, bats could be affected both directly and indirectly. Direct impacts might occur during land clearing operations. Indirect impacts could result from a reduction in the quality and quantity of their habitat. Foraging would not be impacted, as the construction would only be carried out during the day. Impacts on bats during construction only appear possible as a result of habitat destruction.

Habitat may be used for foraging, breeding, roosting and wintering. Since there are no caves within the project footprint or in the vicinity of the sites, wintering habitat is not impacted. The quantity of potential woodland habitat that will be cut to accommodate the turbines is very small compared to the large spreads of forest cover in the

surrounding hills. In this context, potential impacts on bats during project construction, in comparison to forestry operations over the area, is considered insignificant.

Broders et al. state that Nova Scotia is at or beyond the northern limit of the range of the Hoary, Red and Silver Haired Bat and these are generally rare in the province (Broders, H.G., G.M. Quinn and G.J. Forbes, 2003). Broders has conducted a fall survey designed to determine the presence of bats at the turbine locations. The results of this work indicate the population to be lower than expected for the region.

It is unlikely that the construction of the Project will result in a significant adverse environmental effect on the bat population of the province.

Project Operation

Several facets of turbine operation may affect bat populations at wind farms. These are: noise and rotor movement associated with the turbine operations; aeronautical lighting, loss of habitat and the presence of large moving rotors. These features may result in: an interruption in regular behaviour such as feeding, migrating and breeding; displacement to avoid disturbance, disorientation during flight and collisions with turbine blades.

Bats, as indicated in Hugh Broder's study, typically forage at a level below that of the rotating turbine blades. They do; however, migrate at greater heights, and this would be when they would be most susceptible to impact. Since there is little knowledge about the factors that influence the risk of collision for bats, it is difficult to estimate the significance of any impact for the population thus the impact on the total populations is likely negligible.

In summary, although there is always a risk of disturbance and collision associated with the operation of turbines, there is unlikely to be a significant adverse effect on the bat population of the province.

Project Decommissioning

The decommissioning of the Project would involve the dismantling and removal of the turbines. Effects on the bat population, if any, would be comparable to those experienced during Project construction.

It is unlikely the Project will result in a significant adverse environmental effect on the bat population of the province.

Malfunctions and Accidents

During the operation of the wind farm, malfunctions are most likely to involve the stoppage of turbines due to a mechanical problem, or electrical failure such as a break in a power line or cable. The turbines and electrical systems have built-in safety features which shut down the systems and avoid significant damages to the systems and equipment. There are limited quantities of lubricants present in the turbines. Given the

very limited footprint that would likely be involved in such an event, no significant adverse impact on the bat population is predicted.

Mitigation

The study area does not support significant numbers of bats. The indirect effects arising from the removal, fragmentation, or disturbance of habitat during the Project's construction phase has a larger potential to negatively affect the bat populations than the direct mortality from turbine collisions. The mitigation of impacts focuses on minimizing the disturbance caused by the removal and fragmentation of natural habitats, especially wetlands and woodlands. Construction in or across any noticeably sized natural habitats will be avoided. The study area, although not entirely devoid of natural habitat, has been largely altered for forestry purposes and now provides mostly lower quality bird habitat. The design (e.g. turbine shape and lighting) and siting process (e.g. outside of migratory pathways), mitigates many of the potential direct and indirect effects of the Project.

Cumulative Assessment

There are no proposed new works known that will take place in, or in the vicinity of, the turbine sites that might act cumulatively with the construction, operation or decommissioning of the proposed turbines to cause a significant adverse effect on the identified species of concern.

Sustainable Use of Renewable Resources

The project area falls within a region of high wind energy in the province. The generation of electricity at Dalhousie Mountain offers a sustainable source of renewable energy to supplement the province's power demands. This project does not conflict with the present use of the land for other renewable resources principally forest products.

Residual Environmental Impact

The effect of installing the various Project components is anticipated to have limited effect bats during construction or operation of the facilities. Given that the project is generally sited in areas already cleared for forestry use, the study area does not support significant numbers of bats and is not on major migratory route.

The level of impact after protection and mitigation measures have been employed is rated as "low" (i.e., slight decline in resource over life of project).

5.2.9 Visual Landscape

The impact associated with the installation of 34 wind turbines on the landscape has been assessed. A photograph was taken from Saltsprings and computer generated images of turbines were superimposed to provide a picture of what the Wind Farm would look like with up to 45 turbines (see Appendix C1). A visual representation map was created using modelling software showing the number of turbines visible from all locations within 20 km from turbine #11 which is the central location within the project boundary.

The population density within 20 km is very low and the resulting impact on viewscape to residences and passing motorists is considered very low when compared to other wind farm communities. The interesting point about installing turbines on rolling hills is that at closer the vantage points, fewer turbines are visible as they are hidden behind tree cover and hilltops. As the vantage point is moved farther away, the visual impact is greatly reduced due to the overall size of the turbines appearing smaller. Visual impact is very much a subjective matter. In many cases, industrial or commercial operations can provide habitat for some species. For example, the cormorants nesting on abandoned pilings along the Pictou Causeway have become an iconic part of the heritage of this county and even the subject of post cards. It is widely accepted that the visible impacts we see everyday such as roads, bridges, twin highways, power-poles or schools, are installed to service our daily needs. The visual impact of installing 34 turbines in an unpopulated area to provide much needed electricity can only be considered a responsible addition to the aesthetics of Pictou County.

The site is located over 15 km to the west of five towns and the general population in Pictou County with only 20 homes within 2 km of the closest turbine, #'s 28,4,5 and 46. Since the Visual Impact Study was performed, the Proponent has moved the turbines 28, 4, 5 and 46 to a distance greater than 1500 m to mitigate against several impacts.

The proposed wind farm will be visible in the distance. The closest location to view the site is the Trans Canada Highway at the Saltsprings exit. A photomontage was created from this point and made available at the public meetings.

A person's opinion varies on the "type" of change to the viewscape in these ways:

- Accepting a change easily and perhaps enjoying;
- Detracting change;
- Indifference to change; or
- Detracting change evolving to indifference.

In other words, we tend to get used to permanent changes in our surroundings and often, these industrial fixtures become endearing features for our communities, describing the culture or the "way we live". A good example of this is the "causeway" between New Glasgow and Pictou townships or the "Cabot Trail" in Cape Breton, both of which are now seen in many picturesque photos in calendars and tourists' photo albums. At first, many highways and roads have a large visual impact on the immediate area but as time passes, they tend to be viewed as necessary infrastructure serving a need to society. Electricity generation is a very necessary part of our lives and the need for cleaner production will, no doubt be a large contributing factor to the public acceptance to wind farms within view of our homes.

Photomontage

A photomontage shown in Figure 5.3 was prepared by M. K. Ince & Associates Ltd. in June 15, 2007 as part of the Dalhousie Mountain Wind Farm visual assessment.

Fig. 5.3: Photomontage Showing the Project Site with Turbines Superimposed

The following information was used to reference turbine size, location, and appearance in the Photo:

- 1:50,000 scale NTS mapping dated 1994;
- 1:50,000 scale digital elevation model;
- Turbine coordinates as provided by ORTECH;
- Turbine dimensions corresponding to the GE 1.5 sle or the AAER A-1500-77 Hub height of 80 m, rotor diameter of 77 m;
- Photo location coordinates;
- Date and time of photos;
- Approximate focal length of photo;
- Control points corresponding to features cited on NTS map and visible in photos;
- Visual matching of wire-frame digital terrain model to photo landscape;
- Assessment of lighting conditions in photos.

The photos provided to MKI were of high quality. Turbine size, location, and appearance in all photos are realistic due to the accurate match of the digital terrain model to the real terrain shown in the photographs and the verification of the control point. The turbines appear quite small in Photos 6 and 7 due to the distance of the Photographer and the distortion caused by a wide angle lens. The panoramic photo, Fig. 5.3, consists of Photo 6 and Photo 7 stitched together. This process is considered representative, however, may result in slight irregularities in the geometry of certain features. The panoramic photo serves as a conceptual aid (see Appendix C1 for the complete study).

Zone of Visual Influence

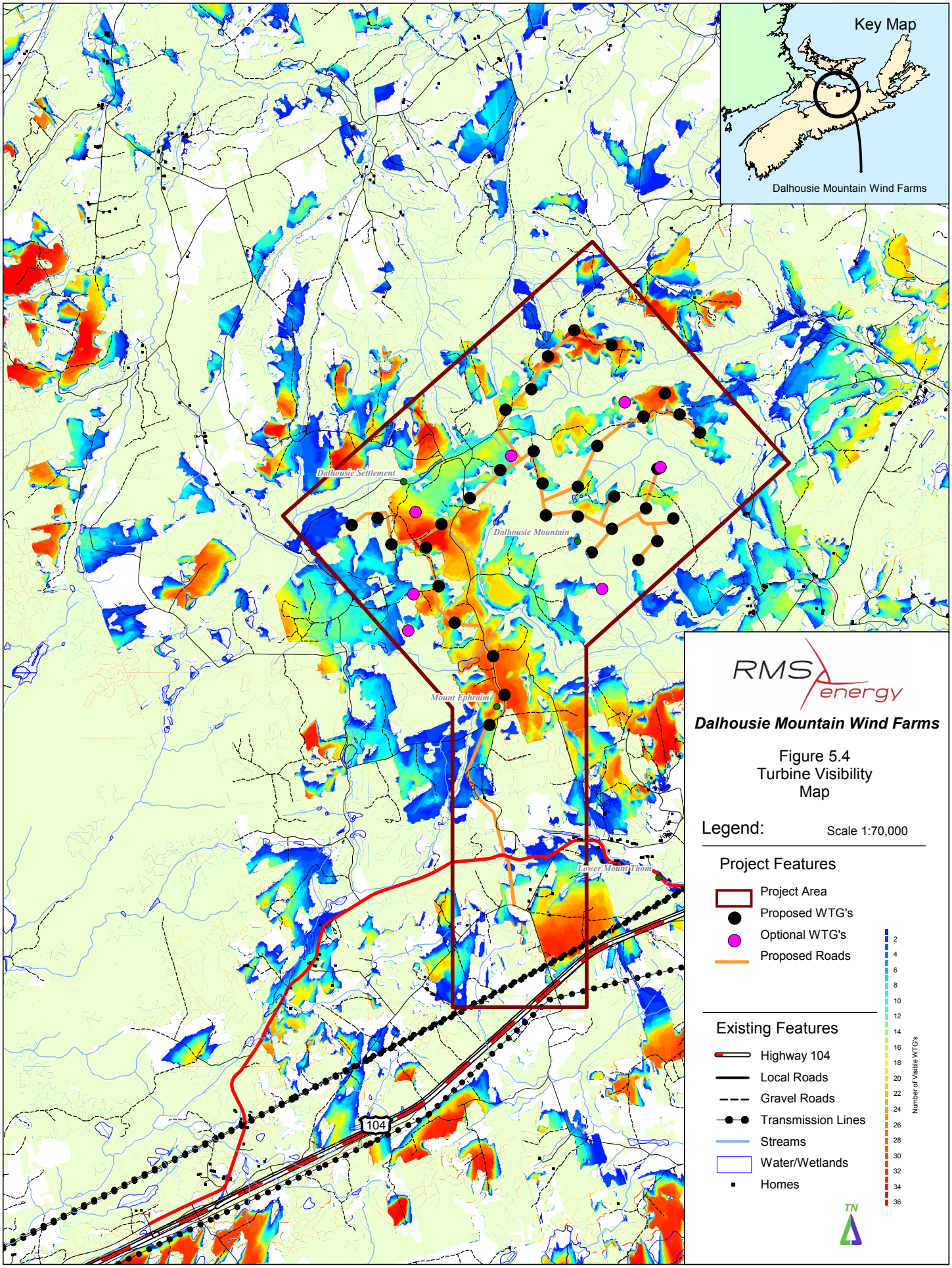
Figure 5.4 is a computer generated projection indicating the number of turbines and the areas of visibility around the project site. The number of turbines visible is indicated by the colour code

In addition, two scenarios were developed and modeled for the Zone of Visual Influence evaluation using WindPRO 2.5.

Scenario 1: Any portion of a turbine is visible
Scenario 2: Hub level of a turbine must be visible (Scenario 2 indicates where turbine aeronautical warning lighting would be visible.)

The following assumptions were applied to both scenarios:

- Forest coverage modeled according to 1:50,000 scale NTS mapping dated 1994;
- Recent forest clear cutting not represented on NTS maps is not accounted for;
- 10 m tree height;
- Canopy is considered to be opaque at all times;


Key Map
Dalhousie Mountain Wind Farms
Dalhousie Settlement
Dalhousie Mountain
Mount Ephraim
Lower Mount Thom
104
RMS Energy
Dalhousie Mountain Wind Farms
Figure 5.4
Turbine Visibility
Map
Legend:
Scale 1:70,000
Project Features
Project Area
Proposed WTG's
Optional WTG's
Proposed Roads
Existing Features
Highway 104
Local Roads
Gravel Roads
Transmission Lines
Streams
Water/Wetlands
Homes
Number of Visible WTG's
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
TN

- 1:50,000 scale digital elevation model;
- Observer eye height of 1.5 m;
- Calculation grid resolution of 25 m;
- 45 turbine layout;
- Turbine dimensions corresponding to the GE 1.5 sle or the AAER A-1500-77 with a hub height of 80 m and rotor diameter of 77 m;
- Modeled area extends roughly 10 km from edges of the wind farm, approximately 25 km x 27 km

Conclusions

Scenario 1

4.9% of the modeled area surrounding the Dalhousie Mountain Wind Farms will have a line of sight to at least a portion of 1 Project wind turbine which is considered a small percentage when compared to projects in non-forested areas.

Locations in or adjacent to deforested areas not represented on the NTS mapping used for the assessment, may also have a line of sight to at least a portion of 1 Project wind turbine even if the ZVI map does not so indicate.

Locations in or adjacent to forested areas with a non-uniform canopy may also have a line of sight to at least a portion of 1 Project wind turbine even though the ZVI map does not so indicate (Cited MK. Ince Associates).

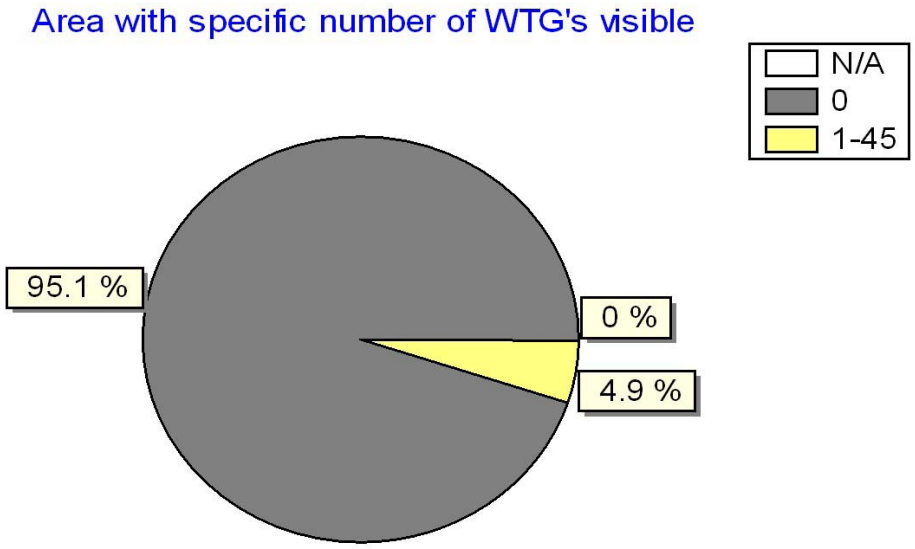


Figure 5.5: Pie Chart Showing the Percentage of the Area with Turbine Visibility for Scenario 1

Scenario 2

4.2% of the modeled area surrounding the Dalhousie Mountain Wind Farms will have a line of sight to the hub level of at least 1 Project wind turbine considered to be a small percentage when compared to projects in non-forested areas.

Locations in or adjacent to deforested areas not represented on the NTS mapping used for the assessment may also have a line of sight to the hub level of at least 1 Project wind turbine even though the ZVI map does not so indicate.

Locations in or adjacent to forested areas with a non-uniform canopy may also have a line of sight to the hub level of at least 1 Project wind turbine even though the ZVI map does not so indicate (see Appendix C3 for complete study).

Boundaries

The area of visual impact has been studied for a 10 km radius or more around turbine P1-11, carried out by MK. Ince Associates. The results of the study indicate that the farther away the receptor, the more turbines are visible and are harder to detect visibly. Closer receptors cannot see more than a few turbines from one place.

Access roads

New roads could be viewed from certain points in the county and all of the major access roads exist requiring only ditching and grading with gravel as described in Section 2.

Project Construction

During the construction phase, large transport vehicles and construction cranes will be on-site and in the area to erect the turbines and ancillary facilities. The scale of the equipment required to construct the Project will be larger than what most persons are familiar with, even in contrast to most agricultural equipment. Consequently, construction machinery has the potential to temporarily affect the local viewscape.

The erection of the turbines will change the Visual Landscape, however local residents have indicated that this change is acceptable and will not be considered significant.

Project Operation

The key potential effect during the operation phase of the Project is visibility and its association with a change in the present viewscape. The diameter of the tower base is approximately 5 m, nacelle height is 80 m, and the blades are 37 m long. Turbines or a portion (i.e. blades) will be visible for some distance in the surrounding areas. However, visibility of the turbines will vary from receptor to receptor, based upon the following factors:

- Landform shape, largely determined by physiography and tree cover;
- Slope – the greater the slope the more easily turbines can be seen from greater distances;

- Viewing – distance from the turbines reduces scale;
- Lighting – primarily affecting night time visibility.

The erection of the turbines will change the Visual Landscape, however local residents have indicated that this change is acceptable and will not be considered significant.

Project Decommissioning

During the decommissioning phase large transport vehicles and construction cranes will be on-site and in the area to dismantle the turbines and ancillary facilities. The scale of the equipment required to de-construct the Project will be larger than what most persons are familiar with; even in contrast to most agricultural and forestry equipment. Consequently, construction machinery has the potential to temporarily affect the local viewscape.

Decommissioning will restore the landscape to its original form and therefore will have no significant net effect on Visual Landscape.

Mitigation

Construction activities will be confined to the workspace areas which will assist in limiting the potential disruptions to the viewscape. Further, it is expected to take about three days to erect each turbine, which will also assist in dispersing the visual changes over the course of the construction period (i.e. they will not be heavily concentrated in one area). Dust, which can also produce short-term visibility effects, will be controlled by gravelling the road surfaces.

During operation, the visual characteristics of the project and the surrounding wooded landscape are considered to exhibit minimal to moderate scenic attributes with respect to landscape distinction. That is, the landform of the study area tends to exhibit indistinct surface patterns due to uniformity in land-use and vegetation. Dalhousie Mountain has a complex terrain and heavy logging has occurred over the last 20 years.

To soften the look of the turbines, the towers will be painted light grey and made out of rolled steel (i.e. they are not steel lattice towers). The nacelle and blades will also be light grey in colouring. Light grey colouring was selected since it is generally understood that this colouring blends with the environment in comparison to other colours such as white. Given the general uniformity in landform patterns, limited slope, multiple viewing locations from residences and transportation routes, and moderate scenic attributes throughout the study area, representative visual simulations of what the proposed Project would look like were prepared. The simulations were prepared from two viewing locations throughout the study area as shown in Appendix C1. The visibility factors noted above reduce the visibility of the turbines. Transport Canada's Aerodrome Safety Branch will review the Project to determine lighting requirements with respect to the provision of navigation warning lights to ensure the aeronautical safety of wind farms; it is proposed that not every turbine be lighted for navigational purposes. While

maintaining pilot safety, this approach would reduce observed lighting effects in the local area and make the Project less attractive to avian species. Further, if Transport Canada permits a choice between red or white, solid or flashing lights, the Project proposes to use medium intensity white flashing lights during daylight and low intensity red during the night. The final navigational requirements will be determined with Transport Canada's Aerodrome Safety Branch prior to the start of Project commissioning. As for the property values within the viewscape of the Project, studies carried out in Australia, Europe, and the U.S. all indicated no material effect to property values in the viewscape of a wind farm. No additional protection or mitigation measures are proposed.

Cumulative Assessment

There are no other wind farms in the county and gravel pits or rock quarries are the only major industrial activities within the viewscape of this project. If Phase 2 is developed, it will interact and add cumulative effects to the viewscape at that time.

Residual Environmental Impact

With the implementation of the identified protection and mitigation measures and considering the dispersed nature of the construction activities, no net adverse effects have been identified. The installation and operation of the wind turbines will permanently alter the existing viewscape; however, existing landform and appropriate tower colouring and lighting will combine to reduce the extent of this effect. While it is true that beauty is in the eye of the beholder when it comes to the aesthetics of wind turbines, the fact that local and provincial support for the Project has been overwhelming cannot be overlooked.

The effect of installing the various Project components will have an effect on the local viewscape during construction and operation of the facilities.

Based on Table 5-2, the impact is predicted as "Low" (i.e. slight decline in resource over life of project).

5.2.10 Public Health and Safety

Safety policies with company procedures have been put in place to ensure the Project complies with all industry standards and good utility practice to protect the public. Electrical installations connecting to the Provincial grid must comply with and maintain certification and liability insurance throughout the life of the project. In order to obtain a final connection permit, completion certificates from Federal, Provincial and Municipal offices must be granted throughout the construction phase.

The Municipality has setback distances of 300m from public roads, 600m from houses and the height of the turbine from a non-participating property line. Setbacks greatly reduce the risk of the general public from being involved in situations that could be hazardous such as ice throw from rotating blades. Statistics available suggest that there

haven't been any incidents of a non wind farm worker being injured by the operation of wind turbines. An insurance policy has been reviewed with an experienced underwriter in the field which identifies areas of concern and how to reduce these risks.

Boundaries

The primary boundaries for public health and safety are access roads and beneath the turbines where icing and vehicle accidents are the main concern. The boundaries associated with icing are restricted to the turbine locations. The temporal boundaries include both construction and decommissioning, but are primarily associated with Project operation.

Access Roads

Winter operations will have an increased risk of accidents on the access roads, and ice shed by the rotor. Generally, the main Dalhousie Mountain road is not ploughed therefore vehicle access is restricted with a heavy snowfall. Snowmobilers who rely on this trail system as a corridor to access their camp and lands also pose a safety concern.

Project Construction

Potential effects to public health and safety are largely in the form of increased construction related traffic and unauthorised access by the public to the work sites. Based on construction taking place in the summer months, icing would not to be an issue during construction.

No significant effect on Public Health and Safety is predicted due to proper mitigation methods and work habits.

Project Operation

The Project will not contribute green house gases or other atmospheric pollutants to the environment and thus no air-related public health concerns associated with the operation of the Project have been identified.

Accumulation of ice on the turbine blades is possible during the winter months when the turbines may be coated by freezing rain or the interception of low clouds containing super cooled rain. The two hazards associated with ice accumulation on wind turbines include: the danger of falling ice that may accumulate on the turbine itself as a result of freeze-thaw of snow and ice; and the throwing of ice from the moving turbine blades.

Falling ice from an immobile turbine does not differ from other tall structures like communication towers, power lines and antenna masts. The ground area potentially affected by falling ice depends to a large extent on the blade position and the prevailing wind speed. Conservative modelling documented by the Finnish Meteorological Institute (2000) indicates that "when a blade has an azimuth of 90°, wind speed is 10 m/s, and the ice weights 15.3 kg, the fall distance is about 40 metres. In comparison, when a blade has an azimuth of 0°, wind speed is 20 m/s, and ice weights 1.5 kg, the fall distance is reduced to about 30 metres".

Regarding turbines throwing ice, the throwing distance varies depending upon the rotor azimuth, rotor speed, radius, and wind speed. Also, the geometry of the ice fragments and their mass will affect the flight trajectory. *The Finnish wind tunnel studies* suggest ice throw from smaller turbine blades (e.g., 15 to 20 m) which have a higher rpm and more blade energy than the GE turbines proposed for the Project, have an average range of 25 to 100 m depending upon the ice fragment's mass. Throwing distances for turbines with a blade length of 30 to 33 m are recorded at <75 m depending upon the fragment's mass. Based upon this trend shown in the available data, it is expected that ice throw from a 37 to 40 m blade, similar to those used in this Project, would be less than the 33 m blade. This is primarily due to the fact that larger blades tend to turn more slowly in comparison to smaller blades, creating less energy to throw the ice. In terms of icefall and throw, it is important to note that the reality of icing is likely limited to a few days per year. That is to say, icing of the turbine blades is not an every day occurrence. The turbines are located on private land away from human habitation and therefore public access is limited and unlikely during adverse weather which could create this condition.

Although highly improbable, any tall structure exhibits the possibility of collapse. Although very unlikely, there is also the possibility of blade detachment from the turbine structure under extreme conditions. Should either of these events occur, and given the weight of the wind turbine components, there is potential that the collapse zone and/or landing area would be damaged from the impact. The turbines have been designed using engineering design criteria with large safety factors and designs exceed the extreme environmental conditions for project area.

No significant effect on Public Health and Safety is predicted during the operations phase due to the application of proper engineering methods in the turbine design.

Project Decommissioning

The decommissioning of the WTGs would pose comparable safety issues associated Project construction. Comparable safety standards and mitigation strategies will be employed.

No significant effect on Public Health and Safety is predicted due to application of proper safety measures.

Malfunctions and Accidents

If an occurrence were to take place, personnel will use the Emergency Response Procedures which will be in place during the entire project. Any malfunction or accident will require the immediate notification of the safety officer who will determine the required response. Prior to commissioning, the Fire Department will be provided with the appropriate maps of the project site, roads and turbine locations and instructions for site access.

Mitigation

Implementing good transportation planning and safety measures during construction will minimize the potential for traffic related safety concerns. Public safety has been and will continue to be incorporated into the Project design. Land access to the construction site will be controlled through signage and restricted to authorized personnel only. The construction will also employ good site safety practices during the construction phase. RMSenergy Ltd. will ensure that the wind turbines are maintained and operated in accordance with all applicable codes and regulations. Maintenance personnel will continuously undertake additional safety measures, such as automated and manual surveillance and adherence to health and safety policies.

Many of the perceived safety concerns related to Project operation will be mitigated through the built-in safety measures and standard procedures for wind turbine operation and maintenance and control systems. Critical alarms on-site are directly linked to emergency personnel, to expedite response to potential events at the facility. Potential effects due to operation malfunctions are mitigated through this control and alarm system.

Unlike telecommunication towers, the wind turbines purchased for this Project will have a solid conical tower. This design reduces the potential for ice build up on the tower itself since there is no lattice or crevices for ice to accumulate. No other specific protection or mitigation measures are available to address ice fall. In terms of ice throw, when the rotor becomes unbalanced due to a change in blade weighting (e.g., caused by ice build up), the turbine brake is automatically applied to stop the blades from turning (i.e., it shuts itself off). The blades will not restart their movement until the imbalance is removed (e.g., the majority of ice is removed). This design feature greatly reduces the potential ice throw from the turbines on the few days per year when icing is possible.

The structural integrity of the GE turbines is designed to withstand wind speeds of about 200 km/hr, equivalent to a Level 2 tornado. However, during high wind events (i.e., >25 m/s or about 90 km/hr) the turbines will cease operations. Turbine braking is accomplished by full blade feathering. Each blade is equipped with a hydraulic cylinder enabling the blade to rotate 95 degrees to easily pass the wind without causing lift. In addition, the nacelle has a yaw system that allows the entire blade assembly to be turned so as to not catch the wind. A secondary fail-safe mechanical brake system is mounted on the high speed shaft connecting the gearbox to the generator. The blades of the turbine weigh over six tonnes. Thus, in an extreme weather and unlikely malfunction event where the blades would detach from the rotor, they would drop to the ground rather than be flung a great distance.

Cumulative Assessment

Safety concerning vehicle operation and icing is an issue related to the proposed Project.

There is no interaction with other works or activities taking place in a similar timeframe that would aggravate icing events.

Sustainable Use of Renewable Resources
N/A

Residual Environmental Impact
Icing that may occur during the construction, operation or decommissioning of the Project is not anticipated to have a significant residual effect on Public Safety.

Based on Table 5-2, residual environmental impact is predicted to be "minimal" (i.e. the resource should return to baseline levels).

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5.2.11 Heritage Sites, Archaeological Sites and Other Cultural Resources

In accordance with provincial guidelines and regulations, an Archaeological Resource Impact Assessment has been carried out by Davis Archaeological Consultants Limited on behalf of the Proponent. Discussions were held with landowners to identify any previous settlement foundations and cemeteries. A desk top study indicates that there are no registered Heritage Sites of any kind identified on the sites at this time. An archaeological field study in accordance with the Special Places Protection Act of Nova Scotia Tourism, Culture and Heritage (Permit # A2007NS40) was conducted at the selected turbine locations and along the access road corridor.

The field study was conducted over and around the selected turbine locations and along the access road corridor to identify and map potential historical resources in the work areas. Discussions were held with landowners to identify any previous settlement foundations and cemeteries. Davis identified the five following sites of archaeological significance in the project area:

- The *John Arthur House* and nearby *Possible Cemetery*
- The *Charles McIntosh House*
- The *John L. Rae House*
- The *John Mackenzie Jr. House*, barn and nearby circular depression
- The *William Reid House*

None of these sites are within the areas scheduled for access roads or turbines and no disturbance of these sites will occur as a result of project activities.

In addition to the above surveys, the proponent has conducted over 600 hours of site investigations along all existing and proposed corridors and construction pads. The proponent has conducted extensive searches for obvious indications of previously settled lots along all easements and turbine pads. The proponent will directly supervise

machinery operations (excavators and bulldozers) to ensure that excavation and clearing does not take place outside the designated area of the plan.

Boundaries
The Boundaries include any path, road and construction area to be disturbed by any phase of construction or operation or decommissioning of the project

Access roads
Along all site access roads the potential to find foundations, cemeteries and tools exists and during road repair or construction these resources may be lost or damaged.

Project Construction
Given the potential for the discovery of as-yet unrecovered artefacts, there is some potential for these resources to be lost or damaged over the course of Project construction activities. As with most areas in Nova Scotia, there is also a limited potential to discover burial areas.

No significant effect on Heritage Sites, Archaeological Sites and Other Cultural Resources is predicted due to proper mitigation methods based on avoidance and work controls.

Project Operation
Once the turbines, access roads, power lines, and ancillary facilities are installed, no additional effects on historical and/or archaeological resources are expected.

No significant effect on Heritage Sites, Archaeological Sites and Other Cultural Resources is predicted due to proper mitigation methods and work controls.

Project Decommissioning
No additional effects on historical and/or archaeological resources are expected during decommissioning.

No significant effect on Heritage Sites, Archaeological Sites and Other Cultural Resources is predicted due to avoidance of potential sites.

Malfunctions and Accidents
No interaction is expected to occur in conjunction with accidents due to pre-planned construction paths which have been reviewed previously.

Mitigation
The project access road layout and selection of turbine location avoids potential on heritage sites, archaeological sites and other cultural resources. Sites having Archaeological or historic significant have been surveyed and identified. Should an undiscovered site be exposed, the proponent will stop work at the location and notify the N. S. Museum Authorities, the RCMP and Davis Archaeological Consultants Ltd, immediately. Employees and contractors will not work at the discovery location until

such time as the Project Manager, having consulted with Robert Ogilvie and or Davis Archaeological Consultants Limited, advises those involved as to the disposition of the discovery and authorizes a continuation.

Cumulative Assessment
There are no known activities scheduled in the area which could compound the projects effect on this environment

Sustainable Use of Renewable Resources
N/A

Residual Environmental Impact
The effect of installing the various Project components is anticipated to have limited effect on historical and archaeological resources during construction or operation of the facilities. The areas where such resources occur have been surveyed and will be avoided by project activities. No significant negative net effects are anticipated to historical and/or archaeological resources.

Using Table 5-2, the level of impact after protection and mitigation measures have been employed is rated as “minimal” (i.e. the resource should return to baseline levels).

5.2.12 Waste Disposal

Waste disposal will be managed on a full time bases by Keltic Trucking Ltd. in accordance with the procedures of Pictou County Solid Waste Management and internally managed by the Proponents Safety Officer to ensure the policies are in place to follow a rigid reduction and recycling program which meets or exceeds these requirements.

Excess soils from foundation excavations will be re-used in the construction of roads or used for fill in select areas of the project sites. Any soils excess to these requirements will be offered to landowners or placed in selected borrow areas for future use.

Boundaries
The Boundaries include any lay down area, path, roads and/or construction area to be disturbed by any phase of construction or operation or decommissioning of the project.

Access Roads
Wastes will be managed along all site access roads.

Project Construction
Wastes will be generated during construction. The waste include: domestic wastes at work sites and construction areas; sanitary wastes; wastes associated with the maintenance of equipment; wastes from construction activities; waste packaging; and wood debris and excess soils for cleared areas.

Project Operation

Wastes generated during the operation of the project will include replacement parts which will be repaired, recycled as scrap metal. Lubricants will be collected and recycled at provincially approved facilities. Wastes will not be allowed to accumulate on site.

Project Decommissioning

Decommissioning of the turbines will generate significant waste materials much of which will have retained value as functioning equipment or value as scrap metals. To the greatest extent, these materials will be re-cycled. Foundations and non-metal debris will be broken up and used as fill or stockpiled in a borrow pit for future use. Other waste will be removed by a licensed waste hauler for disposal following the regulations Pictou County Solid Waste Management.

Malfunctions and Accidents

Wastes resulting from malfunctions or accidents will be collected and removed from the site. These materials will be sold as scrap for recycling or collected for disposal following the regulations of Pictou County Solid Waste Management. Lubricants will be collected and recycled at provincially approved facilities. Soils which might be contaminated by petroleum products will be removed for disposal in a provincial approved facility.

Mitigation

Accident prevention is the fundamental principle for mitigating accidents and malfunctions. Safety policies and operations procedure will be followed during the construction phase. The personnel on the project will be experienced and trained and the construction will be supervised by individuals with prior experience in the construction of wind farms. The design and materials used in the construction will meet or exceed the requirements of engineering designs. The turbines are constructed to the highest standards of the industry and have an excellent performance history.

Maintenance is the key element to mitigating malfunctions during the operational life of the project. RMSenergy will have a maintenance base near the project site and will have trained personnel to service the equipment to the manufacturer's specifications.

Cumulative Assessment

To the extent possible, waste materials from the project will be re-used or re-cycled. During construction some non-recyclable wastes will be generated which will require disposal. The cumulative effect of the limited quantities of such wastes will be minimal.

Sustainable Use of Renewable Resources

Over the life-cycle of the project, the generation of wastes will be minimized. The proponent will follow the principles of 'reduce, reuse, recycle' during all stages of the project.

Residual Environmental Impact:
Using Table 5-2 the residual environmental impact is predicted to be "low".

5.2.13 Neighbourhood and Community Characteristics

Neighbourhood and community characteristics are identified as a VEC because of potential impacts on the local community from the project. The characteristics of the local community are well understood and appreciated by the proponent who is from the community. RMSenergy is a local firm committed to development and providing economic opportunities in the community. Community related issues are also discussed in: Section 5, Existing Land Uses; Visual Landscape; and Noise.

Boundaries
Potential impacts on neighbourhood and community characteristics are viewed within the boundary of Pictou County and the residents in the immediate vicinity of the project.

Access Roads
New roads within the project area will be considered a positive impact by landowners and others using the area for recreational activities. The Pictou County Trails Association (PCTA) plans to connect the walking trails from Fitzpatricks Mountain to the Gully Lake Wilderness Area through the trails on Dalhousie Mountain. A Cooperation Agreement has been signed between the PCTA and RMSenergy to cooperate in this endeavour and to share information and resources to benefit the public and the environment. This agreement applies to lands leased by RMSenergy and land use outside these areas is subject to the approval of individual landowners. A copy of the draft agreement is appended to this document in **Appendix AS: 4**.

Project Construction
During the construction phase, large transport vehicles and construction cranes will be on-site and in the area to erect the turbines and ancillary facilities. The scale of the equipment required to construct the Project will be larger than what most persons are familiar with, even in contrast to most timber harvesting equipment. Consequently, the movement of this construction machinery has the potential to temporarily affect the local public roads and access roads. The movement of machinery on public roads will strictly adhere to safety requirements and be conducted at times which are considerate of the neighbouring residents.

The project will provide employment opportunities to the local population. RMSenergy is a local firm which will employ approximately 20 equipment operators, truck drivers, labourers and support personnel during the construction phase. These employees will be drawn from the local labour supply. Economic spinoffs will occur principally to suppliers for the construction industry including repair and maintenance operators and fuel suppliers. Employment incomes will have a multiplier effect on the local economy.

The construction activity during erection of the turbines will have temporary low impacts on traffic. Employment in the construction sector will have a positive impact on the local economy enhanced incomes and multiplier effects.

Project Operation

The neighbouring community will become accustomed to the routine activities of the operation of the wind farm. This stage of the project will provide long term employment opportunities for maintenance and operations personnel. The Municipality will receive tax revenues from the development and the community will derive economic benefits from enhanced incomes and associated multiplier effects.

The operations phase will have minimal impacts on the local traffic. Long-term employment will have a positive impact on the local economy through enhanced incomes and multiplier effects.

Project Decommissioning

During the decommissioning phase large transport vehicles and construction cranes will be on-site and in the area to dismantle the turbines and ancillary facilities. The scale of the equipment required to de-construct the Project will be larger than what most persons are familiar with; even in contrast to most agricultural and forestry equipment. Consequently, construction machinery has the potential to temporarily affect the local viewscape.

Decommissioning will restore the landscape to its original form and therefore will have no significant net effect on Visual Landscape.

Mitigation

Construction activities will be confined to the workspace areas which will assist in limiting the potential disruptions to the viewscape. Further, it is expected to take about three days to erect each turbine, which will also assist in dispersing the visual changes over the course of the construction period (i.e. they will not be heavily concentrated in one area). Dust, which can also produce short-term visibility effects, will be controlled by gravelling the road surfaces.

During operation, the visual characteristics of the Project and the surrounding wooded landscape are considered to exhibit minimal to moderate scenic attributes with respect to landscape distinction. That is, the landform of the study area tends to exhibit indistinct surface patterns due to uniformity in land-use and vegetation. Dalhousie Mountain has a complex terrain and heavy logging has occurred over the last 20 years.

To soften the look of the turbines, the towers will be painted light grey and made out of rolled steel (i.e. they are not steel lattice towers). The nacelle and blades will also be light grey in colouring. Light grey colouring was selected since it is generally understood that this colouring blends with the environment in comparison to other colours such as

white. Given the general uniformity in landform patterns, limited slope, multiple viewing locations from residences and transportation routes, and moderate scenic attributes throughout the study area, representative visual simulations of what the proposed Project would look like were prepared. The simulations were prepared from two viewing locations throughout the study area as shown in Appendix C1. The visibility factors noted above reduce the visibility of the turbines.

Transport Canada's Aerodrome Safety Branch will review the project to determine lighting requirements with respect to the provision of navigation warning lights to ensure the aeronautical safety of wind farms; it is proposed that not every turbine be lighted for navigational purposes. While maintaining pilot safety, this approach would reduce observed lighting effects in the local area and make the Project less attractive to avian species. Further, if Transport Canada permits a choice between red or white, solid or flashing lights, the Project proposes to use medium intensity white flashing lights during daylight and low intensity red during the night. The final navigational requirements will be determined with Transport Canada's Aerodrome Safety Branch prior to the start of Project commissioning. An application has been made on behalf of RMSenergy Ltd. The lighting scheme is shown in Figure 2.8.

As for the property values within the viewscape of the Project, studies carried out in Australia, Europe, and the U.S. all indicated no material effect to property values in the viewscape of a wind farm. No additional protection or mitigation measures are proposed.

Cumulative Assessment

There are no other wind farms in the county and gravel pits or rock quarries are the only major industrial activities within the viewscape of this project. If Phase 2 is developed it will interact and add cumulative effects to the viewscape at that time.

Residual Environmental Impact

With the implementation of the identified protection and mitigation measures and considering the dispersed nature of the construction activities, no net adverse effects have been identified. The installation and operation of the wind turbines will permanently alter the existing viewscape; however, existing landform and appropriate tower colouring and lighting will combine to reduce the extent of this effect. While it is true that beauty is in the eye of the beholder when it comes to the aesthetics of wind turbines, the fact that local and provincial support for the Project has been overwhelming cannot be overlooked.

The effect of installing the various Project components will have an effect on the local viewscape during construction and operation of the facilities.

Based on Table 5-2, the impact is predicted as "Low" (i.e. slight decline in resource over life of project).

5.2.14 Climatic Fluctuations and Extreme Events

Climatic fluctuations and extreme events identify potential impacts of the existing environment on the project and are key elements in establishing safe design criteria for the project components. Therefore climatic variations and extreme weather conditions are a VEC for wind power development and project design. The assessment of *Effects of the Environment on the Project* is further considered in Section 5.4 below.

The Proponent has carried out almost 4 years of recording climate data at 4 meteorological towers on Dalhousie Mountain. This data has been thoroughly analyzed by a reputable company to determine the turbine suitability. Research of existing public data was also carried out and compared to the operating equipment parameters and it has been determined that the site is suitable for this project and can produce electricity safely and predictably (see Appendix C10).

Boundaries

The effects of climate fluctuations and extreme events are considered within the project boundary. Setback distances, the project location on private lands and the design criteria for turbines and electrical equipment are considered sufficient controls on risk to address public safety as a result of extreme events. The design criteria for turbines exceed the maximum wind conditions which can occur at the site.

Access Roads

Potential impacts on access roads would occur as a result of extreme environmental rainfall. The 100 year maximum rainfall condition has been used in culvert design to control runoff and prevent damage and washouts on access roads. To the extent possible, access roads have been located at elevations which minimize low wet areas which collect runoff water and water crossings.

Project Construction

Extreme weather conditions will hamper the construction phase of the project. Safety requirements and procedures will consider wind conditions particularly during the lifting operations for the installation of the turbines. The movement of equipment to the site will be over highways and local roads which are less susceptible to extreme weather conditions than other modes of transport. The plan for the construction phase will incorporate contingencies for weather conditions and consider seasonal conditions.

Climate conditions and extreme weather events may have temporary low impacts on project construction activities.

Project Operation

The influence of climate change falls within the design parameters of the project and therefore, it is unlikely that climate change will have a significant impact on the wind resources of the project area and the viability of the project.

The engineering design for the turbines exceeds the potential extreme wind condition by a significant margin of safety. As a safety measure, turbines will be shutdown during extreme wind conditions. It is highly unlikely that extreme wind conditions will have a significant impact during the operation phase of the project.

Climate change and extreme weather conditions will have a minimal impact on the operations phase of the project.

Project Decommissioning

During the decommissioning phase large transport vehicles and construction cranes will be on-site and in the area to dismantle the turbines and ancillary facilities. These operations will be conducted when weather conditions permit. For safety reasons, decommissioning will not be conducted under extreme weather conditions.

Extreme weather conditions may delay decommissioning but will have no significant net effect as the work will only be conducted under favourable conditions.

Mitigation

Construction activities will be guided by safety procedures and conducted by experienced personnel. This will mitigate the impact of extreme weather conditions from a safety and loss perspective. Typically extreme events are short lived (a few days) and therefore the delays are manageable and can be addressed in the contingency plan for the project.

The design criteria for turbines and access roads exceed the potential environmental conditions which might be encountered during extreme events. The project has been designed to mitigate extreme conditions which might be encountered. .

Cumulative Assessment

Cumulative negative impacts related to Climate Change and extreme events are not anticipated.

Residual Environmental Impact

Extreme weather conditions may have low residual impact on construction costs due to lost time and additional fees for cranes and other equipment.

Based on Table 5-2, the impact is predicted as “Low” (i.e. slight decline in resource over life of project).

5.2.15 Soils, Terrain and Vegetation

The topography, soils and vegetation of the project area are considered a VEC as these features are important considerations in the assessment of environmental conditions and the suitability of the site for the construction of wind turbines.

Historical published data from the Department of Natural Resources in the 1960's, classes the soil from an agricultural perspective as a class "zero", meaning the quality of the soil does not support sustainable farming even with considerable amounts of soil amendment and yearly field work. The project therefore does not compete with the existing commercial use as forest land. These issues are further discussed in Existing Land Use Section 5 and Botany and Flora Section 5.

Boundaries

Potential Impacts on soils, terrain and vegetation are considered in the immediate area disturbed by construction of the roads, lay down area and the turbine pads. There will be a 40m wide easement along all access roads from the interconnection point at the south to the substation and linking all turbines throughout the Wind Farm. The lay down area will be under 0.5 ha. Specific turbine sites were considered within a 75 m radius from a central GPS location selected by the Proponent. Construction of the roads and turbine foundations may take place in any area within these bounds including moving a turbine to the outer edges of the radius of the defined study area. The ability to move within the study area boundaries (but not outside of) is very necessary to provide responsible consideration to many other environmental features within the immediate footprint such as:

- Finding suitable soil conditions for the foundation integrity by means of a geotechnical study;
- Ensuring previous land use such as foundations do not lie under the surface;
- Interference with nesting wildlife at the time of construction (this cannot be responsibly predicted until several days immediately prior to construction);

Regardless of the location of the roads or turbines within this pre-studied area, the overall land use size will not increase; it will merely be relocated within the 150 m studied areas and the roads will be wide enough to provide safe travel for the flatbed trucks and cranes and to locate the collector lines along the ditches.

Access Roads

During construction, new access roads will be constructed and existing access roads widened. These activities will require the removal of vegetation, alter the terrain and cover existing soils with rock and gravel fill suitable for road building. Ditches will be constructed where required and culverts will be lengthened at existing site or installed where new roads are required. These activities will follow provincially mandated

methods which minimize potential environmental impacts and control erosion and potential siltation to water bodies and wetlands.

A small bridge over a stream on the MacLean's Sugarbush Road will be replaced with an open bottom culvert. Although, the calculated culvert size is 550mm or 22", an open bottom culvert is proposed which allow changes to the slope of the road on either side of the stream. This culvert will be anchored to concrete foundations in the dry on either side of the stream. The design permits a required change to the grade level and slope of the road, without disturbing the streambed.

The installation of access roads is expected to have a low impact on the terrain, soils and vegetation.

Project Construction

During construction, the use of excavators, bulldozers and trucks will impact terrain, soils and vegetation. All potential turbine locations have been assessed for plants and plant communities of special concern and artefacts of archaeological and First Nations interest. No work will be permitted in those areas where such artefacts have been identified.

Construction of the turbine foundations will require the excavation of existing soils and the construction of concrete bases for the towers and infilling and grading around the tower bases for the crane pad and the lay down are for the turbine components. These activities will alter the surface soils and vegetation in the immediate area of the turbine. With the exception of an access area for maintenance, once turbine construction has been completed, the areas will be allowed to naturally re-vegetate.

This area has been subject to significant human activity over the past two centuries with attempts to establish farming and subsequent logging activities. These anthropogenic activities have altered terrain, soils and vegetation.

The impacts of construction activities on the terrain, soils and vegetation is predicted due to low as areas with sensitive vegetation will be avoided.

Project Operation

Once construction has been completed, project operations will consist of accessing the sites for maintenance operations. No further impact on terrain, soils and vegetation is anticipated.

No significant effect on terrain, soils and vegetation is predicted.

Project Decommissioning

Decommissioning will involve dismantling the turbine and any ancillary electrical equipment and the removal of concrete and steel foundations. By following the same work procedures of the construction phase without the actual construction, the

disassembly will require using the proposed existing routes and crane pads to remove the equipment. The roads will be left in place and the turbine locations will be re-vegetated as the landowner requires as it ultimately belongs to them. Typically, this would be in the form of merchantable wood as on the surrounding land or a mixture of plant species which are common to the area. Introduction of exotic plant species will be avoided.

No significant effect on terrain, soils and vegetation is predicted due to proper mitigation methods.

Malfunctions and Accidents

The largest risks to terrain, soils and vegetation associated with malfunctions and accident involves vehicles and machinery accidents resulting in contamination by petroleum products and the risk of fire. There will be onsite procedures in the form of an emergency response plan for reporting and responding to such accidents.

The Emergency Response Plan will be prepared in consultation with the West River Fire Department Chief and will establish procedures to be in place upon initiating the construction phase to deal with logistics of fires and spills. A site map will be provided to the Chief and to RMSenergy Ltd. employees along with emergency call-out numbers. During commissioning the emergency response procedures will be maintained as will radio communications to the Wind Farm control centre to provide lockout confirmation and procedures for safe contact with electrical components. NSE will be notified at the time of any applicable emergencies.

Mitigation

Efforts have been made to ensure that the Project is sited on previously cleared lands along existing roads and not in natural areas. However, limited clearing of trees will be required to facilitate the installation of the turbines and ancillary facilities such as the access roads and collector lines. The soils, vegetation and terrain of the study area contain few constraints for wind power development since the preferred locations for turbines are: exposed, previously cleared areas; typically upland vegetation units; and the properties are almost invariably entirely located in forestry areas. The proposed sites, if not previously cleared, are slated for deforesting in the next few years regardless of the development of this project.

Prior to construction, the limits of vegetation clearing will be staked and the Construction Contractor will ensure that no construction disturbance occurs beyond the staked limits. Edges of woodlots and other sensitive areas including the areas near rare plants as previously described (see Appendix C4) are not to be disturbed.

To the extent practical, clearing operations will be completed prior to the spring season 2009, reducing the damage to the underlying root base for all plants as the frost will be set and the mountain is typically snow covered. Stream crossings and culvert

installations will be scheduled for dry periods and low flow conditions. This schedule along with adherence to the Nova Scotia Environment's Erosion and Sediment Control Manual will mitigate potential discharges of sediment into streams.

Cumulative Assessment

In the short term, this Project will have a cumulative affect on the removal of vegetation in the area when combined with logging activities. However; in the longer term, this cumulative impact is negated by logging activities which are taking place regardless of whether any wind power development proceeds.

Land-use for the Wind Farm represent relatively small footprint of less than 2% of the properties involved. Since forest harvesting is scheduled to take place on the same lands as the turbines, the combined use would not be considered a new significant negative impact. The use of the land is at the discretion of the landowner.

Sustainable Use of Renewable Resources

The project area falls within a region of high wind energy in the province. The generation of electricity at Dalhousie Mountain offers a sustainable source of renewable energy to supplement the province's power demands. This project does not conflict with the present use of the land for other renewable resources principally forest products.

Residual Environmental Impact

The project will alter the present status of terrain, soils and vegetation, although these features have been altered through previous anthropogenic activities. The road improvements will provide the existing users with better and safer access to a main corridor through the area. This will allow many of the small trails and roads to go unused and become re-forested.

The level of impact on terrain, soils and vegetation after protection and mitigation measures have been employed is rated as "minimal" (i.e., the resource should return to baseline levels).

5.2.16 Construction Related Traffic

The influence of additional construction related traffic on local traffic patterns and road use in considered a VEC. During the construction phase, additional truck traffic over local roads to the project area will increase during daylight hours and for a very short period of time as reflected in the construction schedule. Most traffic related trucking activity will occur when the turbine components are trucked to the site. Trucking and earthworks for construction of roads and turbine installation will be on private lands. The work site will be "off-limits" to the public for safety reasons and to prevent onsite congestion for project vehicles.

The transportation of turbine components will require trucking from the manufacturer/supplier to the site over major highways. Ground transportation of the turbines will be arranged by the manufacturer in Q1 2009. Transportation will be planned and undertaken by a logistics company and a customs broker to determine the delivery schedule and border crossing rules. The 3 steel tower sections and the 3 blades for each of the 34 turbines will most likely come from Quebec in September 2009, the generator/nacelle section will come from the USA starting around September 2009.

The transportation route will follow the TransCanada Highway through to Nova Scotia where it will take TCH #104. This highway will be followed until Exit 18A in Mount Thom where it will continue east for approximately five km. The route will turn north into the Weeks Rock Quarry where the route becomes part of the wind farm boundary (see Fig. 2.7, Transportation Route Plan).

Boundaries

Potential impacts of construction related traffic are considered within the context of the neighbourhood and community within the boundary of Pictou County. The transportation route for turbine components follows the TransCanada Highway which is a multi-lane controlled access highway over much of its length. Since this highway is intended for the purpose of commercial trucking it is not considered within the boundary for assessment of potential impacts from the project.

Access Roads

Construction related traffic will have potential impacts on local roads when equipment and trucks are arriving on the site. Public access will be curtailed along the present roads during construction as a matter of public safety and to prevent congestion which would impede the work.

Project Construction

Dump trucks may be commissioned from local owners for daily on-site trucking of bulk materials (gravel fill and rock). These trucks may arrive on-site in the morning, work onsite during the day and leave the site in the evening. Under these circumstances, early morning and late evening traffic could increase on the local roads around the project area. Heavy equipment will likely arrive on-site on transporters, and remain on site for the duration of the contract period. The operators of this equipment will travel daily to the work site in cars or pickup trucks. This will add possibly 10-20 cars on the local roads in the morning and evening.

During the construction phase, large transport vehicles will carry turbine components to the construction sites. The components for each turbine will be transported on approximately 8 large tractor trailers. It will require approximately 272 trucks to transport all the turbine components to the site. The scale of the turbine equipment will be very large and therefore slow moving. Consequently, the movement of these components has the potential to temporarily affect the local public roads and access roads. The

movement of machinery on public roads will strictly adhere to safety requirements and be conducted at times which are considerate of the neighbouring residents.

The large cranes used in the assembly of the turbines will be brought to the site in components and then assembled on-site. Transporting the various components of cranes to and from the project site may hinder traffic on public roads near the project site for short periods during the commissioning and decommissioning of the cranes. Following completion of each turbine, the crane will be disassembled and moved to the next location. These activities will be confined to the project area and will not hinder traffic on public roads.

Vehicle activity during the construction phase and erection of the turbines will have temporary low impacts on traffic.

Project Operation

The maintenance operation for the Dalhousie Wind Farm is located near the project site. The project operations will include daily commuting of staff to this area and a minor increase in local traffic.

The operations phase will have minimal impacts on the local traffic.

Project Decommissioning

During the decommissioning phase, large transport vehicles and construction cranes and earth-moving equipment will be on-site and in the area to dismantle the turbines and ancillary facilities. The impacts on traffic during the demolition phase will be similar to that of the construction phase.

Vehicle activity during the demolition phase of the turbines will have temporary low impacts on traffic.

Mitigation

The proponent will consult with local manager of Nova Scotia Transportation and Infrastructure Renewal (TIR) to develop a working plan for transportation management. The Proponent will make all necessary applications to TIR to comply with the permitting requirements for excess and oversize loads.

The mitigation of potential impacts on local traffic will focus on preventing congestion through the management of trucking schedules, the management of materials supply schedules and proper controls on truck traffic at the entrance to the project area. The work site will be “off-limits” to the public for safety reasons and to prevent on-site congestion for project vehicles. The Proponent will have site plans and personnel at key points to direct traffic and maintain flow.

Cumulative Assessment

The activities associated with construction related traffic will be confined to the Construction and dismantling periods of the project. The increased levels of truck traffic on the Trans-Canada Highway associated with this project are within the capacity of a four lane controlled access highway. Although there may short-term truck traffic congestion particularly near the entrance to the site, no long-term impact is likely. .

Residual Environmental Impact

With the implementation of the identified protection and mitigation measures, construction related activities will have no significant residual impact on local traffic.

Based on Table 5-2, residual environmental impact is predicted to be "minimal" (i.e. the resource should return to baseline levels).

5.2.17 Aboriginal Interests

Aboriginal interests and concerns regarding traditional heritage issues are a VEC for this assessment. Desk top surveys using maps and information from the Museum of Nova Scotia, a meeting with The Confederacy of Mainland Mi'kmaq (CMM), phone calls and communications with First Nations individuals indicate that no known First Nations Sites exist within the Project boundary. No objections to the project have been raised in these consultations. In fact, the project is very suitable to the natural way of life that the First Nations settlers of this Country are well known to support. In many First Nations communities throughout Canada, installation of wind power facilities are being located on Native Lands and built by First Nations Companies.

The proponent has commissioned desk top and field studies by Davis Archaeological Consultants and a Mi'kmaq Ecological Knowledge Survey (MEKs) by The Confederacy of Mainland Mi'kmaq to ensure no important unknown sites are disturbed.

Boundaries

The Boundaries include any path, road and/or construction area to be disturbed during any phase of construction, operation or decommissioning of the project

Access Roads

Aboriginal interests are to be considered along all site access roads. Visual evidence indicates the potential to find foundations, cemeteries and tools associated with previous human settlement in the area. The results of the MEK study will be incorporated into the development plans for access roads and monitoring will be conducted during road repair or construction to ensure any potential resources are not lost or damaged. There is also abundant evidence of European settlement in the area.

Project Construction

Given the potential for the discovery of as-yet unrecovered artefacts, there is some potential for these resources to be lost or damaged over the course of Project

construction activities. Site monitoring will be conducted and the findings of the MEK study used to preserve any aboriginal heritage sites identified during construction.

No significant effect on First Nations Heritage Sites or other Cultural Resources is predicted due to proper monitoring methods, avoidance and work controls.

Project Operation

Once the turbines, access roads, power lines, and ancillary facilities are installed, no additional effects on First Nations heritage sites are expected.

No significant effect on First Nations Heritage Sites or other Cultural Resources is predicted due to proper monitoring methods, avoidance and work controls.

Project Decommissioning

No additional effects on historical and/or archaeological resources are expected during decommissioning.

No significant effect on First Nations Heritage Sites or other Cultural Resources is predicted due to proper monitoring methods, avoidance and work controls.

Malfunctions and Accidents

No interaction is expected to occur in conjunction with accidents due to pre-planned construction paths which have been reviewed previously.

Mitigation

Site planning and monitoring will be used to mitigate potential impacts on this VEC. First Nations personnel have been commissioned to conduct an MEK study and all work areas have been identified for assessment as potential sites of concern or interest. Should any sites of interest be identified, the CMM will be notified along with Mr. Robert Ogilvie (Manager, Special Places, Nova Scotia Museum). Work in the area of the find or artefact will be suspended until the site has been investigated. The project plan may be altered to establish an exclusion zone around the artefact site. The Project Manager will authorize continuation only after having consulted with the CMM and Robert Ogilvie and or Davis Archaeological Consultants Limited.

Cumulative Assessment

There are no known activities scheduled in the area which could compound the projects effect on this environment.

Sustainable Use of Renewable Resources

N/A

Residual Environmental Impact

The effect of installing the various Project components is anticipated to have limited impact on aboriginal interests and archaeological resources. The construction and

operation of the wind farm has a very small footprint and the historical evidence indicates the limited use of this area by First Nations and early European settlers. No significant negative net effects are anticipated to historical and/or archaeological resources.

Using Table 5-2, the level of impact after protection and mitigation measures have been employed is rated as "minimal" (i.e. the resource should return to baseline levels).

5.3 Site Sensitivity

To determine the Site Sensitivity, the Table on page 8 of the *Proponent's Guide to Wind Power Projects* by NSDEL was consulted. The combination of site size (Medium) and the potential site sensitivity (Low) resulted in the Project Category being **Category 1**.

5.4 Effects of the Environment on the Project

Specifically, this section assesses the potential of climatic fluctuations in the study area as well as the potential effects that extreme weather and natural events may have on the Project. These issues are also addressed in Section 5.2.14 Climate Fluctuations and Extreme Events.

The climate of the area is predominately controlled by South West winds in the summer and North West during winter. The weather patterns, alternate from warm humid air from the Gulf of Mexico to cold dry air from the Arctic. Global computer climate modelling indicates an increase in the variability of the weather patterns with increases in more extreme events (i.e. more frequent low and high temperature events). Overall an increase in average annual temperatures is projected with an increase in precipitation amounts (Climate Change Science Program et al, 2004). The increase in extreme conditions is likely to be accompanied by increases in wind speeds. As noted previously, the turbines have a cut out speed (i.e. shut off) of 25 m/s.

Extreme events include rain, hail, ice storms, fire, tornadoes, earthquakes, and lightning strikes. The following events have been considered and are included within the various Project design components:

- Rain – surficial drainage patterns will remain intact and continue to convey rain water;
- Hail – the turbine blades, nacelle, and tower are constructed of materials to withstand damage from the impact of hail;
- Ice storms/freezing rain – the turbines are designed to automatically shut down when there is any significant ice load on the blades;
- Tornadoes – the blades will stop moving at wind speeds greater than 25 m/s, even though they are designed to withstand the forces of a Level 2 tornado (i.e., 200 km/hr), and the foundation design will resist similar forces;
- Earthquakes – structures are designed to meet the earthquake loads;

- Lightning – the turbines and substation will be equipped with lightning protection systems designed to accept the electrical charge and transfer it to the ground; the systems may be equipped with lightning strike sensor to determine the number of strikes and whether it is necessary to send out an inspector prior to the turbine being placed back in service.

5.5 Summary of Valued Eco-systems Components, and Significance of Impacts

Table 5.4 provides a summary of the potential effects, mitigation measures, net effects, and the significance of those net effects for all project specific issues. For clarity, this summary is broken down to identify the effects during Project Construction, Project Operation and Decommissioning.

The residual environmental effect of all the above potential issues is rated as "Low" or "Minimal" and it has been determined that no significant effects are predicted due to proper mitigation methods and work habits.

Table 5.4: Summary of VECs and Significance of Impacts

Section	Valued Eco-system Components (VECs)	Significance of Net Effect
5.2.1	Flora/ Botany	Minimal
5.2.2	Surface, groundwater quality and fish habitat	Minimal
5.2.3	Species at Risk, Wildlife, and their habitats	Low
5.2.4	Avian species, including migratory birds	Low
5.2.5	Existing land use	Minimal
5.2.6	Air quality	Minimal
5.2.7	Environmental noise	Low
5.2.8	Bats	Low
5.2.9	Visual landscape	Low
5.2.10	Public health and safety	Minimal
5.2.11	Heritage sites, archaeological sites and other cultural resources	Minimal
5.2.12	Waste disposal	Low
5.2.13	Neighbourhood and community characteristics	Low
5.2.14	Climatic fluctuations and extreme events	Low
5.2.15	Soils, terrain and vegetation	Minimal
5.2.16	Construction related traffic	Minimal
5.2.17	Aboriginal interests	Minimal

SECTION 6.0 – PROJECT FOLLOW-UP MEASURES AND MONITORING

This section describes the program of follow-up measures and monitoring that will be undertaken by RMSenergy Ltd. in relation to Phase I of the Dalhousie Mountain Wind Farms. RMSenergy Ltd. intends to honour all commitments made in this Environmental Assessment, and will conform to all applicable Provincial and Federal Laws and Regulations.

6.1 Monitoring Plan Structure

6.1.1 Goals

The main goals of the follow-up monitoring plan for the proposed project are to:

- Monitor the efficacy of the proposed protection and mitigation measures;
- Assess potential impacts on avian species;
- Verify compliance of the project with applicable Municipal, Provincial, and Federal standards and guidelines.

6.1.2 Objectives

Specifically, the objectives of the monitoring plan will be:

- To minimize the effects on the flora, fauna, and natural habitats
- To conform with all environmental quality standards set by Municipal, Provincial and Federal laws and regulations

6.2 Environmental Management Systems

Various plans, programs, and procedures will be established by RMSenergy Ltd. to guide all stages of construction, operation, and decommissioning and to minimize the effects of the proposed project on the environment as stipulated in Section 6.1.

6.2.1 Management Structures

As previously mentioned, the Proponent is committed to constructing, operating, and decommissioning the proposed wind farm in an environmentally responsible manner in compliance with all Provincial and Federal relevant laws and regulations. Among other things, this implies that RMSenergy Ltd. and all construction contractors and sub-contractors involved in this project will have appropriately skilled personnel to conduct the environmental responsibilities as defined in this EA. Furthermore, all contractors, subcontractors, and other associates of the proposed project will respect the guiding principles of the monitoring program as well as all relevant Municipal, Provincial, and Federal Laws and Regulations. The intentions of the Proponent with respect to the

overall environmental performance of the project will be communicated to all of its employees and the construction contractors. In the eventuality that changes are required to address unforeseen or unexpected conditions or situations regarding any phase of the Project, RMSenergy Ltd. and the construction contractor will be responsible for ensuring environmental and safety issues are addressed.

6.3 Programs, Plans and Procedures

6.3.1 Environmental Protection Plan and Environmental Management Plan

Draft copies of the Environmental Protection Plan and Environmental Management Plan are provided in Appendices AS 7 and AS 8 respectively. These documents include a series of plans and procedures covering all critical construction and environmental management tasks.

6.3.2 Operation and Maintenance Program

The Proponent will develop an operation and maintenance program to be applied during pre-operational mobilization. The program will be based on existing procedures developed for wind turbine facilities constructed by Canadian companies. Specifically, the program will cover predictive and/or preventive maintenance, routine maintenance, annual overhauling, inspection of equipment and components, procurement of spare parts, and a schedule for regular inspections of the turbines and ancillary facilities (access roads).

6.3.3 Environmental Procedures

The Proponent will be responsible for implementing all approved environmental procedures during the operation phase of the Project. The environmental procedures will address different issues including:

- Establish the specific dates and times for environmental inspections of turbines, monitoring programs, and emergency notifications
- Spills and releases procedures
- Solid waste management procedures
- Hazardous waste management procedures
- Storage management procedures

6.3.4 Avian Species Monitoring

The project is considered a Category 2 site based on the criteria provided in the *Proponent's Guide to Wind Power Projects*. The following conditions are the basis for this evaluation:

- Wind farm size: Medium *(11- 40 turbines)*

- Site Sensitivity: Medium *(Site is recognized as regionally or locally important to birds, or contains provincially significant habitat types)*

A two-year post-construction bird and bat monitoring program will be developed in consultation with the Canadian Wildlife Service (CWS) and will follow the *Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds (Draft,* CWS May 1, 2006). The monitoring program will reflect the most current guidance on post-construction monitoring at wind farms, and will include provisions for the development of mitigation measures as a result of any unanticipated adverse environmental effects.

The post-construction monitoring program will include standardized carcass searches, scavenger removal trials, and searcher efficiency trials. The recommended frequency, coverage and data tabulation methods will comply with the Protocols for such surveys. The survey information will be provided to the Department of Natural Resources and the local office of CWS

6.3.5 Noise

A noise monitoring program will be implemented upon commissioning and as mentioned in Section 5.2.7 Noise. As an added mitigation measure, additional soundproofing mat will be installed on the turbines closest to the residences which are over 1500 m away. Turbine noise at 1500 m is practically inaudible and can be expected to fall within the natural level of background sound.

6.3.6 Mainland Moose

As previously mentioned, the area is identified as having potential habitat for Mainland Moose population. It has been determined that no Mainland Moose population resides in or near the project boundary (10km radius from turbine # P1-11). The findings of a study carried out by Ross Hall, a Biologist with extensive experience on moose population, consultation with NSDNR, written accounts by three residents who work the land within the project boundaries and a letter from a retired NSDNR game warden all concur that mainland moose have been absent in the project area for least 30 years.

The decline in the Mainland Moose population has been attributed to a number of factors including: a parasite carried in deer *(p. tenuis*) which is eventually fatal to moose; habitat loss and fragmentation; human disturbance; and poaching.

Due to the endangered status of Mainland Moose, RMS energy will conduct area searches (pellet surveys) once every 2 years for 6 years from the date of commissioning. These surveys will be conducted on the same 15, 1km long x 4m wide transects used as a baseline search in the Dalhousie Moose Study (2007). The information can then be used as baseline or reference material for the Provincial Moose Recovery Program.

6.3.7 Soil Erosion

Approximately 1 year after construction has been completed, a visual survey along all roads, access routes and turbine pads will be undertaken to ensure the long-term erosion control measures have been effective. Excavation, straw bales and seeding measures will be carried out to maintain the roads, ditches and crane pads to a standard required to allow daily use in a safe and clean manner.

6.3.8 Occupational Health and Safety Procedures

The Proponent and all its contractors and sub-contractors will undertake all the measures necessary to ensure employee health and safety is maintained throughout their employment term. In addition, training programs will be developed to ensure that personnel receive appropriate training in relation to operation and maintenance programs, environmental, health and safety procedures, as well as emergency response plans.

SECTION 7.0 – EFFECTS OF THE UNDERTAKING ON THE ENVIRONMENT

RMSenergy Ltd. is responding to a Provincial and Federal strategy to provide approximately 20% renewable power to the Provincial grid by 2013. RMS energy was successful inn its bid to Nova Scotia Power Inc. and has been awarded a 51MW contract to produce wind generated electrical power for 25 years.

7.1 Project Advantages and Disadvantages

7.1.1 Project Advantages

The project will provide the following advantages to the local community and the Province of Nova Scotia:

- Renewable, highly reliable, and efficient source of electrical energy
- Clean energy, no air pollution which in time will improve the habitat for all mentioned VECs in this EA, resulting in a net environmental improvement as opposed to a negative impact
- Reduced acid rain which will directly benefit the health of plants, fish birds and people, and which will directly benefit our health
- Fewer greenhouse gas emissions which will contribute to our provincial and national climate change goals
- Reduced emissions of airborne particulates.
- Lower cost electricity: Projections indicate that wind energy will be one of the lowest cost electricity supply alternatives by the end of this decade.
- Employment opportunities during construction: During the construction Phase of the Wind Farm, approximately 30 new jobs will be created
- Permanent employment opportunities: The operation of Phase 1 will result in the creation of approximately 5-8 permanent maintenance and management jobs with RMSenergy's Maintenance and Overhaul facility.
- Personal Income: Landowner royalties will provide income for local families whose ancestors used to farm the land on the settlement. This will also enhance their quality of life and maintain ownership of their land through improved land use. For some landowners, this land use will lead to better forest management practices and preservation.
- Improved Municipal tax base: Municipal governments depend on local tax revenues. Enhanced land values will increase the municipal tax base. There is evidence indicating that the Project will increase property values on Dalhousie Mountain due to the property income potential, road improvements and power lines.

7.1.2 Project Disadvantages

See attached Appendices for individual environmental assessment studies which were carried out to reduce and mitigate the project disadvantages mentioned above.

- There may be potential negative impacts on birds and bats; however, these impacts are not likely to affect regional bird and bat populations or sensitive species.
- New sources of sound are added to the environment,
- There is a potential public safety issue related to ice throw; however, the sites are on private lands where public access is restricted.
- The landscape view will be changed for the project's lifespan (This is a subjective issue which can be seen as a positive change).

7.2 Summary of Conclusions

The examination of current field data indicates that the proposed project will have no significant negative effects on the environment once protective and mitigative measures are applied. Effects of the wind turbines on surrounding lands are expected to be minimal. The project will be mainly sited on previously cleared lands, and thus have minimal effects on forest habitats. Effects of the wind turbines on fauna are also expected to be minimal. It is anticipated that avian mortality due to collision with turbines will be low and will not affect the survival of any species. Modeling of turbine noise at critical receptors demonstrates the voluntary night time rating of 45 dB will not be exceeded at any residence, based on a worst case scenario, it is expected the results will be less again than the study indicated.

The presence of wind turbines will change the visual landscape of the project area. Thus, it is likely that some animal species, especially bats and birds, will avoid the turbine areas. It is also important to mention that significant net positive effects are expected to result from the development of Phase I of the Dalhousie Mountain Wind Farms.

Some of these benefits are:

- The production of 51 MW of clean renewable electricity
- Fewer emissions of greenhouse gases
- Direct local construction jobs and supplies
- Municipal and Provincial taxes paid yearly
- Fire tax levy for the local Fire Hall
- Five to eight new permanent technical jobs for the life time of the project (30-40 years).

7.3 Project Objectives and Justification

The objective of RMSenergy Ltd. is to provide electrical power generation using a renewable resource and offset fossil fuel power generation. A large scale wind farm in Pictou County would compliment the existing coal generated power by sharing the load and resources (fuel) currently supplying electricity to the county. This project is needed to supply additional power to the local grid and offset a 5% annual increase in demand by Nova Scotians.

RMSenergy Limited requests approval for the proposed Phase I of the Dalhousie Mountain Wind Farms. The following conditions will be met or completed:

(1) Implementation of all the mitigation measures described in this document;

(2) Completion of a Post-construction Bird Monitoring Study;

(3) Completion of a Post-construction Mainland Moose Monitoring Program.

SECTION 8.0 – SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

RMSenergy Ltd. is committed to implementing all the appropriate protection and mitigation measures described in this document.

RMSenergy Ltd.

Reuben Burge, President Date

Biologist

Ross Hall, Biologist Date