



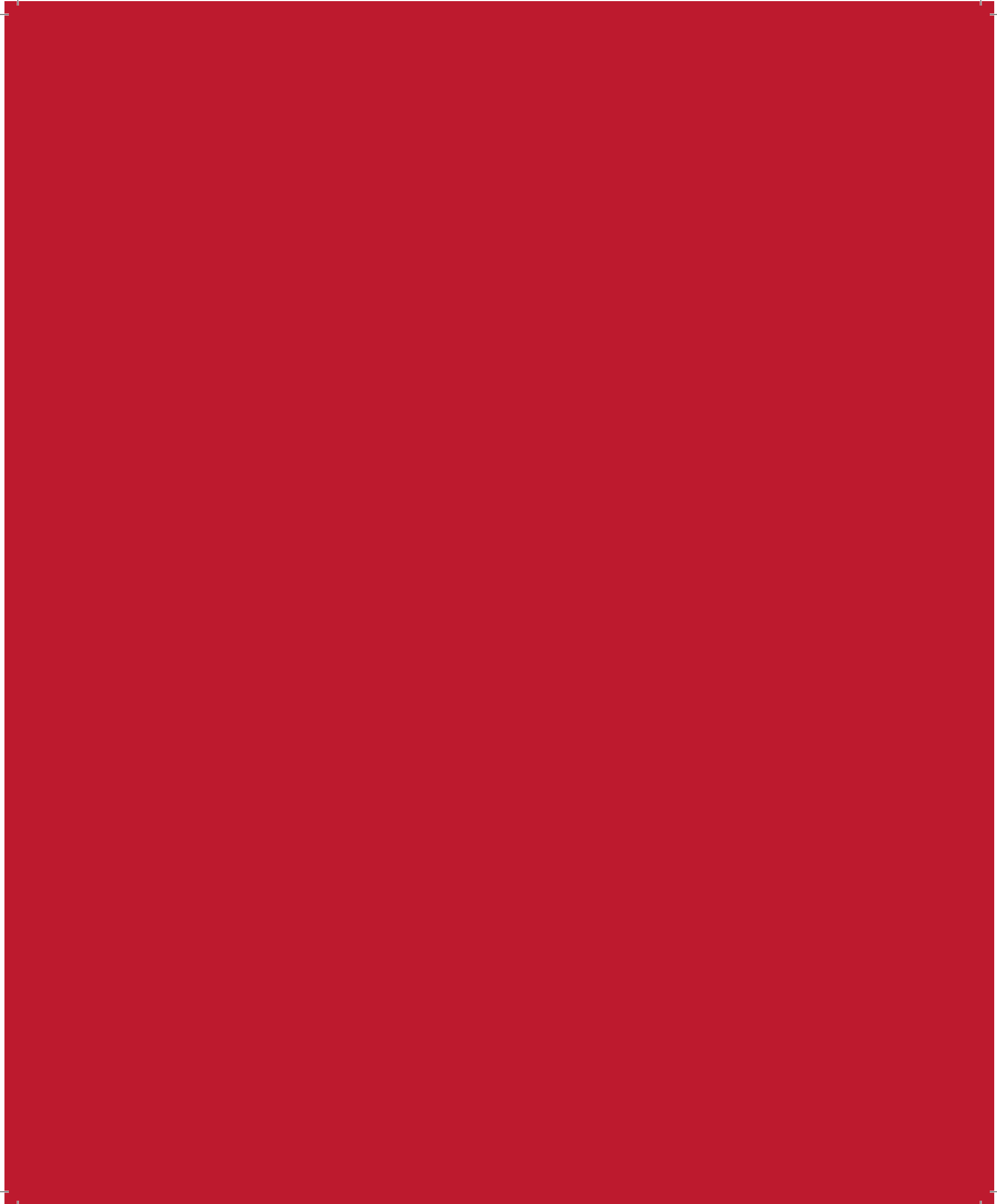
**Whitesand First Nation
Cogeneration and Pellet Mill Project**

Natural Heritage Assessment

Sagatay Cogeneration LP

August 2014







**Whitesand First Nation
Cogeneration and Pellet Mill Project**

Natural Heritage Assessment

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Prepared for:

Sagatay Cogeneration LP, with its General Partner, Sagatay
Cogeneration Ltd., and Whitesand First Nation as agent

August 2014

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Record of Revisions

Revision	Date	Description
0	June 25, 2013	Initial Submission to the Ministry of Natural Resources (Records Review and Draft Site Investigation Methodology Sections only)
1	December 18, 2013	Draft Report Submission for Consultation
2	August 26, 2014	Submission to the Ministry of Natural Resources and Application to the Ministry of the Environment and Climate Change for Renewable Energy Approval

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Executive Summary

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation (“Whitesand”) as agent, is proposing to develop, construct and operate a biomass fueled electric power and heat cogeneration plant, and wood pellet facility (the “Project”). The Project is located on Crown Land in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario. The unorganized territory is administered by the Armstrong Local Service Board and the Project will be located solely on the traditional territory of Whitesand First Nation.

The general Project components include a biomass fueled electric power and heat cogeneration plant, wood pellet plant, maintenance garage, material storage and handling areas, wastewater management system, water storage pond, wells, pump building, and transformer substation. The only biomass used to fuel the cogeneration plant will be woodwaste, making it a Class 1 Thermal Facility under Ontario Regulation 359/09 of the *Environmental Protection Act* (O.Reg. 359/09). The proposed Class 1 Thermal Facility would have a nameplate capacity of up to 3.6 MW, and would displace the energy supply from existing diesel generators servicing the community via a local grid, operated by Hydro One Remote Communities Inc., as well as supply electricity for the Project. The local grid is not connected to the provincial grid, and there are no such future plans for a transmission connection.

Under O.Reg. 359/09, a Natural Heritage Assessment is a required component of an Application for Renewable Energy Approval (REA) for a Class 1 Thermal Facility. The Natural Heritage Assessment is to be completed in four stages as follows:

- Part I: Records Review;
- Part II: Site Investigation;
- Part III: Evaluation of Significance (if required); and,
- Part IV: Environmental Impact Study (if required).

All four parts were completed as part of this assessment.

Part I: Records Review

The Records Review identified existing records of a number of significant or potentially significant features within 120 m of the Project Location which were brought forward for further study in the Site Investigation. In addition, several features were also brought forward due to a lack of background information and records which did not allow their presence to be ruled out. These included:

- Habitat of Threatened and Endangered Species;
- Unevaluated northern wetlands;

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- Candidate Significant Wildlife Habitat, including:
 - Seasonal Concentration Areas of Animals:
 - moose late winter habitat;
 - colonial bird nesting sites
 - waterfowl stopover and staging areas;
 - waterfowl nesting;
 - raptor winter feeding and roosting areas;
 - turkey vulture summer roosting areas;
 - reptile hibernacula; and,
 - bat hibernacula.
 - Rare Vegetation Communities:
 - alvars;
 - tallgrass prairies;
 - savannahs;
 - rare forest types;
 - talus slopes;
 - rock barrens; and,
 - sand barrens.
 - Specialized Habitat for Wildlife:
 - habitat for area-sensitive species
 - forests providing a high diversity of habitats;
 - old growth or mature forest stands;
 - amphibian woodland breeding ponds;
 - turtle nesting habitat;
 - specialized raptor nesting habitat;
 - moose calving areas;
 - moose aquatic feeding areas;
 - mineral licks;
 - mink, otter, marten and fisher denning sites;
 - highly diverse areas;
 - cliffs; and,
 - seeps and springs.
 - Habitat for Species of Conservation Concern:
 - special concern and rare wildlife species.
 - Animal Movement Corridors:
 - animal movement corridors.

Part II: Site Investigation

The Site Investigation was undertaken from August 20 to August 21, 2013 and included:

- a general site reconnaissance;
- vegetation surveys and Ecosite Unit Classification mapping (Racey et.al., 1996);

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- vegetation surveys to identify the boundaries of wetland features using the *Ontario Wetland Evaluation System for Northern Ontario* (MNR, 2013);
- verification and identification of candidate significant wildlife habitat and natural features as outlined in MNR's *Significant Wildlife Habitat Technical Guide* (2000) and in Part I, Records Review of this report; and,
- incidental wildlife and habitat observations.

Work completed during the Site Investigation identified two significant and candidate significant natural features at, and within 120 m of, the Project Location. These include:

- Significant habitat for Threatened and Endangered species; and,
- Candidate habitat for species of conservation concern.

These were both brought forward for further assessment in the Evaluation of Significance.

Part III: Evaluation of Significance

The purpose of the Evaluation of Significance ("EOS") is to:

- Determine if a feature identified during the Site Investigation is:
 - provincially significant;
 - significant; or,
 - not significant.
- Determine, based on Appendix D of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2012), if a feature:
 - must be evaluated;
 - can be treated as significant; or,
 - can be treated as significant as an interim measure and evaluated at a later date.

The EOS was initially conducted as a desktop exercise and included a review of criteria listed in the following documents:

- Significant Wildlife Habitat Technical Guide (MNR, 2000); and,
- Appendix D: Process for Identifying and Addressing Significant Wildlife Habitat in Natural Heritage Assessment Guide for Renewable Energy Projects, Second Addition (MNR, 2012).

No fieldwork was conducted as part of the initial EOS in 2013.

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Results of the initial EOS were as follows:

- Habitat for Threatened and Endangered species (woodland caribou) is provincially significant; and,
- Habitat for Species of Conservation Concern (Olive-sided Flycatcher and Eastern Wood-Pewee) will be treated as significant on an interim basis and confirmed prior to construction.

In June 2014, Northern Bioscience Ecological Consulting performed the pre-construction Habitat Use Studies recommended in the Draft Natural Heritage Assessment (Neegan Burnside, 2013). No Eastern Wood-Pewee, Olive-sided Flycatcher or other bird Species At Risk were observed during the 2014 surveys within the Project Location or adjacent lands.

Results of the final EOS are as follows:

- Habitat for Threatened and Endangered species (woodland caribou) is provincially significant; and,
- Habitat for Species of Conservation Concern (Olive-sided Flycatcher and Eastern Wood-Pewee) is not significant.

Part IV: Environmental Impact Study

The primary mitigation measure employed to reduce impacts to natural features and functions was avoidance. Siting of the Project was undertaken with consideration of potential impacts to natural features, wildlife and wildlife habitat. The Project is sited predominately on lands previously disturbed by an old logging camp and past timber harvesting activities.

Category 3 habitat is present for woodland caribou. This habitat does not include any significant features for the species. The Project is located in the vicinity of the existing diesel generation station, an active MTO works yard, railway and an active gravel pit. As such, the site currently experiences disturbances due to noise and human presence. The Project will contribute additional noise sources to the area. Noise has been minimized to the extent possible by site plan design and equipment selection, and the facility will be designed to meet all provincial noise limits as required by O.Reg. 359/09 and the Environmental Compliance Approval (ECA) process.

As such, impacts to woodland caribou are expected to be negligible. No specific mitigation measures are required. However, as the habitat is regulated under the general habitat provisions of the *ESA, 2007*, the MNR will be consulted prior to construction regarding any permitting requirements.

Species of Conservation Concern, including Olive-sided Flycatcher and Eastern Wood Pewee were encountered during the Site Investigation in August 2013, outside the

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applicable breeding bird period. In June 2014 during the applicable breeding bird period, pre-construction Habitat Use Studies did not confirm significant habitat for avian Species of Conservation Concern at, or within 120 m of the Project Location.

While there is no confirmed significant habitat for Species of Conservation Concern at, or within 120 m of the Project Location, the following mitigation measures are recommended as best practices for the protection of migratory bird species:

- Any vegetation clearing should occur outside of the breeding bird season (May 16 to August 8) to avoid disturbance to breeding migratory species of birds.
- If vegetation clearing must occur during this period due to unforeseen circumstances, the area should be surveyed (pre-construction nest survey) by a qualified avian ecologist no more than two days prior to clearing. Appropriate buffers will be applied to confirmed active nests until they are no longer active. If there is confirmed evidence of nesting for species of concern, clearing should be avoided. If clearing cannot be avoided, the MNR will be contacted for advice regarding any potential mitigation options. No work within the affected habitat will occur without MNR approval.
- General mitigation measures will be used to ensure that clearing, grading, material storage and other construction activities do not encroach beyond the Project Location. These are described in detail in the Construction Plan Report and include:
 - The installation of sediment and erosion control fencing to limit the movement of sediment beyond the Project Location; and,
 - The boundaries of the Project Location will be surveyed and clearly marked.
- General mitigation measures will be used to minimize noise during construction and operations to minimize noise disturbance, as described in the Construction Plan Report and Design and Operations Report. Noise levels will be maintained within the limits specified in the REA and ECA approvals.

Environmental effects monitoring for Species of Conservation Concern during Project operation is not recommended as no records of confirmed breeding habitat use by Species of Conservation Concern were documented during the 2014 field data collection.

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1.0 Introduction

1.1 Project Overview

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation (“Whitesand”) as agent, is proposing to develop, construct and operate a biomass fueled electric power and heat cogeneration plant, and wood pellet facility (the “Project”). The Project is located on Crown Land in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario. The unorganized territory is administered by the Armstrong Local Service Board and the Project will be located solely on the traditional territory of Whitesand First Nation.

The general Project components include a biomass fueled electric power and heat cogeneration plant, wood pellet plant, maintenance garage, material storage and handling areas, wastewater management system, water storage pond, wells, pump building, and transformer substation. The only biomass used to fuel the cogeneration plant will be woodwaste, making it a Class 1 Thermal Facility under Ontario Regulation 359/09 of the *Environmental Protection Act* (O.Reg. 359/09). The proposed Class 1 Thermal Facility would have a nameplate capacity of up to 3.6 MW, and would displace the energy supply from existing diesel generators servicing the community via a local grid, operated by Hydro One Remote Communities Inc., as well as supply electricity for the Project. The local grid is not connected to the provincial grid, and there are no such future plans for a transmission connection. The Project Location and Study Area are presented in **Figure A1, Appendix A**.

1.2 Project Location

The Project is located on Crown Land in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario; approximately 210 km north of Thunder Bay, and two km south of Armstrong. The Project will be located on the traditional territory of Whitesand First Nation. This Project context is shown in the key map of **Figure A5, Appendix A**.

The “project location” is defined in O. Reg. 359/09 as:

“a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project”.

The Project Location also includes any temporary work areas required to construct the Project. The cogeneration plant, pellet plant, maintenance garage, wastewater management system, water storage pond, and associated equipment and temporary

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work areas will be contained within a boundary of approximately 35 ha as shown in **Figure A1** of **Appendix A**. For reference, a site plan of the Project is shown within the Project Location on **Figure A1, Appendix A**. Any future site plan changes associated with the Project as a result of detailed design will remain within the Project location.

There is an existing electricity distribution connection owned and operated by Hydro One Remote Communities Inc. that will be used to connect the Project to the local grid. It is within an existing right-of-way extending from the site to the nearby existing diesel generating station. Any upgrades required to the existing electricity distribution connection will be the responsibility of Hydro One Remote Communities Inc.

Solid waste generated by the facility will be disposed of off-site at an approved disposal facility.

1.3 Report Organization

Under O.Reg. 359/09, a Natural Heritage Assessment is a required component of an Application for Renewable Energy Approval (REA) for a Class 1 Thermal Facility. The Natural Heritage Assessment is to be completed in four stages as follows:

- Part I: Records Review;
- Part II: Site Investigation;
- Part III: Evaluation of Significance (if required); and,
- Part IV: Environmental Impact Study (if required).

This report is organized according to these four parts, and has been prepared in compliance with the requirements of O.Reg. 359/09.

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Natural Heritage Assessment Part I: Records Review

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1.0 Records Review Report

1.1 Purpose of the Records Review Report

This section of the report presents the findings of the Part I Records Review and includes a detailed compilation of available background information from a variety of sources, including:

- government agency files;
- policy documents and mapping;
- online and published resources; and,
- aerial photography.

1.2 Records Review Methodology

1.2.1 Study Area

The Natural Heritage Assessment must consider all features within 120 m of the Project Location. The Records Review focused on features within a 120 m Study Area around the Project Location. However, a broader 300 m Study Area was also considered as a precaution. During the Records Review, the Project was still in early development and there was potential for minor adjustments to the Project Location. The 300 m Study Area thus covered the potential for minor changes in the Project Location as the project progressed. Both the 120 m and 300 m Study Areas are shown in **Figure A2** in **Appendix A**.

1.2.2 Site Ecoregion

Vegetation communities in Ontario have been classified in a hierarchical framework. Ecoregions represent the highest level (coarsest resolution) of the classification system.

The Project Location is in within Ecoregion 3W, known as the Lake Nipigon Ecoregion. This Ecoregion will serve as the basis for further vegetation classification and wildlife habitat assessments for this study.

1.2.3 Scope of the Review

The Records Review was conducted in accordance with O.Reg. 359/09 and the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2012).

Information was collected on all features with the potential to be identified as:

- significant habitats of threatened and endangered species;
- provincial parks and conservation reserves;

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- significant areas of natural and scientific interest;
- significant wetlands;
- significant woodlands;
- significant valleylands; and,
- significant wildlife habitat.

1.2.4 Publicly Available Data Sources

A summary of public information sources reviewed for records of potentially significant natural heritage features is provided in **Table 1**.

Table 1 Publicly Available Data Sources Reviewed

Data Source	Information Provided	Reference
Policy Documents		
Crown Land Use Policy Atlas	<ul style="list-style-type: none"> • Provincial parks and conservation reserves 	http://www.mnr.gov.on.ca/en/Business/LUEPS/2ColumnSubPage/STDU_137972.html
Lake Nipigon Forest Management Plan	<ul style="list-style-type: none"> • Aquatic features and wildlife habitats 	http://www.appefmp.mnr.gov.on.ca/eFMP/home.do
Ministry of Natural Resources' Renewable Energy Atlas	<ul style="list-style-type: none"> • Wetlands • Known bat hibernacula 	http://www.mnr.gov.on.ca/en/Business/Renewable/2ColumnSubPage/276957.html
Natural Heritage Information Center, Biodiversity Explorer	<ul style="list-style-type: none"> • Natural areas • Evaluated wetlands • ANSIs • Species at Risk records 	https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/main.jsp
Important Bird Areas database	<ul style="list-style-type: none"> • Significant bird habitat 	http://www.ibacanada.com/mapviewer.jsp?lang=EN
Ontario Breeding Bird Atlas	<ul style="list-style-type: none"> • Species of breeding birds observed in the vicinity of the Study Area 	http://www.birdsontario.org/atlas/index.jsp?lang=en
Ontario Herpetofaunal Atlas	<ul style="list-style-type: none"> • Frog and toad range maps 	http://nhic.mnr.gov.on.ca/herps/frogs.html
Ontario Nature Herpetofaunal Atlas	<ul style="list-style-type: none"> • Reptile and amphibian range maps for Ontario 	http://www.ontarionature.org/protect/species/reptiles_and_amphibians/index.php
Karst mapping	<ul style="list-style-type: none"> • Abandoned mines 	http://www.mndm.gov.on.ca/mine/s/ogs_earth_e.asp

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1.2.5 Requests for Information and Records

Letters were sent to a number of federal, provincial, municipal and other agencies and organizations in order to request additional information and records not publicly available through web searches. In addition, several phone calls and follow-up emails were completed. A copy of all correspondence with agencies is provided in **Appendix B** and is summarized in **Table 2**.

Table 2 Summary of Agencies Contacted, Records Requested and Records Received

Source and Contact Information	Records Requested	Agency Response/Records Reviewed
<p>Source: Environment Canada Contact: Rob Dobos, Manager, Environmental Assessment Section Dates Contacted: May 31, 2013</p>	<ul style="list-style-type: none"> General records of known natural heritage features. 	<ul style="list-style-type: none"> No response to date.
<p>Source: Ministry of Municipal Affairs and Housing- Northwestern Municipal Services Office Contact: Murray Armstrong, Senior Planner Dates Contacted: May 31, 2013</p>	<ul style="list-style-type: none"> General records of known natural heritage features. 	<ul style="list-style-type: none"> No response to date.
<p>Source: Ministry of Natural Resources, Thunder Bay District Contact: Melissa Mauro, District Planner/ Jeff Black, Manager Planning and Information Services Dates Contacted: May 31, 2013 and ongoing regular contact</p>	<ul style="list-style-type: none"> General records of known natural heritage features. LIO/NRVIS data layers including sensitive data. 	<ul style="list-style-type: none"> Access to LIO non-sensitive data permitted through WFN account. Sensitive data provided through a data agreement.

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Source and Contact Information	Records Requested	Agency Response/Records Reviewed
<p>Source: Ministry of the Environment, Thunder Bay District Contact: Scott Sheriff, District Supervisor Dates Contacted: May 31, 2013</p>	<ul style="list-style-type: none"> • General records of known natural heritage features. 	<ul style="list-style-type: none"> • No response to date.
<p>Source: Ministry of the Environment, Northern Region Contact: Ellen Cramm, Environmental Assessment Coordinator Dates Contacted: May 31, 2013</p>	<ul style="list-style-type: none"> • General records of known natural heritage features. 	<ul style="list-style-type: none"> • No response to date.
<p>Source: Ministry of the Environment, EAAB Contact: Narren Santos, Senior Program Support Coordinator Dates Contacted: May 31, 2013</p>	<ul style="list-style-type: none"> • General records of known natural heritage features. 	<ul style="list-style-type: none"> • No response to date.
<p>Source: Ministry of Northern Development, Mines and Forestry Contact: Jennifer Lillie-Paetz, Environmental Assessment Coordinator Dates Contacted: May 31, 2013</p>	<ul style="list-style-type: none"> • General records of known natural heritage features. 	<ul style="list-style-type: none"> • No response to date.
<p>Source: Ministry of Northern Development, Mines and Forestry Contact: Marc Leroux, Manager, Information Services Dates Contacted: May 31, 2013</p>	<ul style="list-style-type: none"> • General records of known natural heritage features. 	<ul style="list-style-type: none"> • June 20, 2013 letter response from Mark Puumala, Regional Resident Geologist indicating little likelihood of karst hazards, caves or abandoned mines in the area.

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Source and Contact Information	Records Requested	Agency Response/Records Reviewed
Source: Armstrong Local Services Board Contact: Elaine Lawrence, Secretary and Treasurer Dates Contacted: May 31, 2013	<ul style="list-style-type: none">• General records of known natural heritage features.	<ul style="list-style-type: none">• No response to date.

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2.0 Records Review Results

Based on our review of existing information, agency records and in-person meetings with agency staff, a number of natural heritage features are present, or may be present within 120 m of the Project Location and its broader vicinity (300 m Study Area). A detailed description of these features is presented in the following sections. Reference material and background data sources are provided in **Appendix C**.

2.1 Habitat of Threatened and Endangered Species

The Study Area is within the habitat range (continuous distribution) of woodland caribou, (*Rangifer tarandus caribou*), a species listed as Threatened in Ontario under the *ESA, 2007*. Information provided by the MNR indicates that caribou are known to inhabit the region but there are no known observations from within the Study Area (LIO data layers provided by the MNR July 26, 2013).

In general, caribou habitat consists of undisturbed old or mature upland conifer forest and lowland jack pine or black spruce forests (MNR, 2013). Other seasonally specific habitats are also required for important life functions such as nursery/calving areas, winter use areas, and travel corridors. It is unknown if any suitable habitat is present at the Project Location or its vicinity. A Site Investigation will be carried out to confirm whether suitable habitat exists.

A review of the Ontario Breeding Bird Atlas (“OBBA”) identified a record of possible breeding evidence of barn swallow, *Hirundo rustica*, a Threatened species, in the 10 x 10 km square covering the Project Location and its vicinity. Barn swallows often nest in the rafters of human made structures, such as old barns, gazebos and other partially enclosed structures where they may find shelter. Foraging habitat typically includes open fields and agricultural fields. A Site Investigation will be carried out to confirm whether suitable habitat exists.

No other records of Threatened or Endangered species were found through searches of the OBBA, the Natural Heritage Information Centre’s (“NHIC”) Biodiversity Explorer, or Lake Nipigon Forest Management Plan (“LNFMP”).

2.2 Provincial Parks and Conservation Reserve

There are no Provincial Parks or Conservation Reserves in, or within 120 m of, the Project Location. No further study of Provincial Parks or Conservation Reserves will be undertaken.

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2.3 Natural Features in Specified Provincial Plan Areas

The Project is not located within the Niagara Escarpment Plan Area, the Oak Ridges Moraine Conservation Plan Area or the Greenbelt Plan's Protected Countryside Area.

2.4 Wetlands

Northern Wetlands

Neither the Forest Management Plan (LNFMI, 2011) nor the NHIC database (MNR b, n.d.) identified any provincially significant wetlands in, or within the vicinity of, the Study Area. Forest Resource Inventory (FRI) mapping obtained through LIO indicates the presence of several wetlands outside of the Study Area, as shown on **Figure A3, Appendix A**. There are also a number of small ponds in close proximity which may provide wetland habitat along the shoreline (**Figure C1, Appendix C**). As such, this feature will be brought forward to the site investigation for confirmation.

Coastal Wetlands

There are no coastal wetlands located in the vicinity of the Project Location. Therefore, this type of natural feature will not be carried forward to site investigation.

Southern Provincially Significant Wetlands

There are no southern wetlands located in the vicinity of the Project Location. Therefore, this type of natural feature will not be carried forward to site investigation.

2.5 Provincially Significant ANSI (Life Science)

There are no Provincially Significant Life Science Areas of Natural and Scientific Interest ("ANSI") within the vicinity of the Project Location. Therefore, this type of natural feature will not be carried forward to site investigation.

2.6 Provincially Significant ANSI (Earth Science)

There are no Provincially Significant Earth Science ANSI's within the vicinity of the Project Location. Therefore this type of natural feature will not be carried forward to site investigation.

2.7 Significant Valleylands (South and East of the Canadian Shield)

Significant Valleylands are only found south and east of the Canadian Shields. As such, there are no southern significant valleylands located in the vicinity of the Project Location. Therefore this type of natural feature will not be carried forward to site investigation.

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2.8 Significant Woodlands (South and East of the Canadian Shield)

Significant woodlands are only found south and east of the Canadian Shield. As such, there are no southern significant woodlands located in the vicinity of the Project Location. Therefore this type of natural feature will not be carried forward to site investigation.

2.9 Significant Wildlife Habitat

According to the *Significant Wildlife Habitat Technical Guide* (MNR, 2000), significant wildlife habitat includes:

- seasonal concentration areas of animals;
- rare vegetation communities or specialized habitat for wildlife;
- habitats for species of conservation concern; and,
- animal movement corridors.

Each of these types of habitats is discussed in detail below.

2.9.1 Seasonal Concentration Areas

Seasonal concentration areas are areas where animals occur in relatively high densities for the species at specific periods in their life cycles and/or in particular seasons. Seasonal concentration areas tend to be localized and relatively small in relation to the area of habitat used at other times of the year.

Winter Deer Yards

Winter Deer Yards are areas deer move to in response to the onset of winter snow and cold. They typically consists of a core area of mainly coniferous trees (pines, hemlock, cedar, spruce) with a canopy cover of more than 60%. Winter deer yards are identified and mapped by the Ministry of Natural Resources. No deer yards were identified on Forest Management Plan mapping (**Figure C2, Appendix C**) or on LIO mapping. The Study Area falls along the northern limit of wildlife management unit 15B. In this unit, caribou, moose (*Alces americanus*) and white-tailed deer (*Odocoileus virginianus*) are present (MNR, 2013b). According to Ontario's Cervid Ecological Framework and Moose Management Policy, white-tailed deer are managed to maintain a low population density in this area as a means to support and restore caribou populations (MNR, 2013b). As such, this type of habitat will not be studied further and will not be brought forward to the site investigation.

Moose Late Winter Habitat

Moose move to dense conifer stands during mid to late winter in order to find protection from the cold and predators. Such stands also allow for easier movement as snow is

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intercepted and not as deep on the ground. Best habitats typically consist of conifer stands with at least 60% canopy closure. No Moose Late Winter Habitats were identified on Forest Management Plan mapping (**Figure C2, Appendix C**) or on LIO mapping. Although it is unlikely that this type of habitat is present, it cannot be excluded from being within the Study Area and will therefore be brought forward for further investigation.

Colonial Bird Nesting Sites

Colonial birds include several species of herons, gulls, terns and swallow. Species build nesting colonies in a variety of habitats including banks and cliffs, trees and shrubs and open ground. For the bank and cliff habitat type, habitat includes exposed soil banks which have been undisturbed or left to naturally erode. For the trees and shrub habitat type, the habitat consists of swamps and treed fens where nests may be found in live or dead standing trees. For the ground habitat type, habitat consists of any rocky island or peninsula (natural or artificial) within a lake or large river.

The LNFMP did not identify any nesting sites for herons (**Figure C2, Appendix C**); however several colonial bird species were recorded by the OBBA for Square 16CA57 during the 2nd atlas (Square 16CA57 falls within the Study Area). OBBA records are presented in **Table 3**.

This habitat will be brought forward for further consideration in the site investigation.

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Table 3 Colonial Nesting Birds Potentially Present in the Study Area.

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA Status	SARA Schedule	OESA Status	Habitat Descriptions
Barn Swallow	<i>Hirundo rustica</i>	S4B	-	-	THR	Farmlands or rural areas; cliffs, caves, rock niches; building or other man-made structures for nesting; open country near body of water.
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	S4B	-	-	-	Cliffs and bluff with nearby open areas such as farmland, fields or pasture; nests built on buildings, bridges nests; open forest for feeding.
Common Grackle	<i>Quiscalus quiscula</i>	S5B	-	-	-	Farmland, suburbs or abandoned buildings; meadows; marshes, swamps; coniferous trees, hedges; tree stumps; may nest in small colonies.
Great Blue Heron	<i>Ardea herodias</i>	S4	-	-	-	Wetlands, shores of ponds and lakes, marshes, standing trees in open water, swamps, including woodlots; require tall trees for nesting.
Herring Gull	<i>Larus argentatus</i>	S5B,S5N	-	-	-	Undisturbed open, rocky islands, peninsulas or cliffs along lakes or rivers; also on sand dunes or headlands with various types of shores and islands.

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Waterfowl Stopover and Staging Areas

Stopover and Staging areas are used by waterfowl for preparation and resting before and during migration. Important habitat consists of ponds, marshes, lakes, bays, coastal inlets, and watercourses that have an abundance of food supply (mostly aquatic invertebrates and vegetation in shallow water).

No Waterfowl Staging Areas were identified by the Lake Nipigon Forest Management Plan (**Figure C2, Appendix C**), nor the LIO mapping (**Figure A3, Appendix A**).

Two waterfowl species were identified by the OBBA for Square 16CA57 during the 2nd atlas, as listed in **Table 4**; however, these records correspond to breeding season rather than migration periods and may not be a suitable indicator of the presence of this type of habitat.

Further study during the Site Investigation will confirm the presence or absence of this type of habitat.

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Table 4 Waterfowl Potentially Present in the Study Area.

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA Status	SARA Schedule	OESA Status	Habitat Descriptions
Common Goldeneye	<i>Bucephala clangula</i>	S5	-	-	-	Wetlands, rivers or lakes with deep (~2 m) water; open lakes with nearby woodlands and marshy edges; bulrush in water 1 m deep; breeding distribution depends on availability of trees >30 cm diameter (dbh).
Ring-necked Duck	<i>Aythya collaris</i>	S5	-	-	-	Small (<4 ha) wetlands with some surrounding woody vegetation, often in heavily forested areas; shallow swamps, marshes and bogs with emergent vegetation; near reedy lakes or rivers; during migration also use rivers, larger lakes, ponds with marshy edges.

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Waterfowl Nesting Area

For nesting, most waterfowl require open water or wetlands with adjacent grassy or shrubby upland areas. Some species such as hooded merganser and wood duck nest in cavities of large diameter trees (>40 cm dbh) rather than grasslands. No waterfowl nesting sites were identified by the Lake Nipigon Forest Management Plan (**Figure C2, Appendix C**); however, two waterfowl species were recorded in the vicinity of the Study Area in the breeding season by the OBBA for Square 16CA57 during the 2nd atlas. It is unknown whether suitable habitat is present within 120 m of the Project Location. OBBA records are listed in **Table 5**. Based on the potential presence of this habitat, it will be brought forward for further study during the Site Investigation.

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Table 5 Nesting Waterfowl Potentially Present in the Study Area.

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA Status	SARA Schedule	OESA Status	Habitat Descriptions
Common Goldeneye	<i>Bucephala clangula</i>	S5	-	-	-	Wetlands, rivers or lakes with deep (~2 m) water; open lakes with nearby woodlands and marshy edges; bulrush in water 1 m deep; breeding distribution depends on availability of trees >30 cm diameter (dbh).
Ring-necked Duck	<i>Aythya collaris</i>	S5	-	-	-	Small (<4 ha) wetlands with some surrounding woody vegetation, often in heavily forested areas; shallow swamps, marshes and bogs with emergent vegetation; near reedy lakes or rivers; during migration also use rivers, larger lakes, ponds with marshy edges.

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Shorebird Migratory Stopover Areas

Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded shorelines can provide migratory stopover areas for shorebirds. Important areas are along the Great Lakes shorelines and Southern James Bay. As such, suitable habitat is not present in the Study Area and this type of habitat will not be assessed further during the Site Investigation.

Landbird Migratory Stopover Areas

Significant habitats are only present within 5 km of the Lake Erie and Lake Ontario shorelines. This type of habitat is therefore not present within the vicinity of the Project Location and will not be carried forward for further investigation.

Raptor Winter Feeding and Roosting Areas

A review of the OBBA for Square 16CA57 during the 2nd atlas identified the potential for American kestrel (*Falco sparverius*) in the vicinity of the project. Given their known range and habitat preferences, other species of raptor may also be present in the area, such as broad-winged hawk (*Buteo platypterus*) and sharp-shinned hawk (*Accipiter striatus*). OBBA observations were conducted during the spring breeding period and thus it is unclear whether winter habitat is present. Wintering habitat typically includes a combination of fields and woodlands. Open fields that support small mammal populations, such as mice and voles, adjacent to mature mixed or coniferous woodlands provide the best habitat. This type of habitat will be brought forward for further investigation during the site investigation to determine whether suitable habitat is present in the Study Area.

Wild Turkey Winter Range

Wild turkeys inhabit areas in southern and central Ontario. The Study Area is well beyond their northern range. As such, this habitat is not present and will not be brought forward for further investigation.

Turkey Vulture Summer Roosting Areas

Turkey vultures have increased their range expansion dramatically province-wide in the last century in all regions with the exception of the Hudson Bay Lowlands (Bird Studies Canada b, 2001-2005). Summer roosting areas are difficult to identify. Sites that consistently support the largest numbers of roosting birds and are exposed to the least amount of disturbance are most significant. Given the potential presence of turkey vultures in the Study Area, this type of habitat will be brought forward for further study during the Site Investigation.

Reptile Hibernacula

Hibernation takes place in sites located below frost line in burrows, rock crevices, and other natural locations. Areas of broken and fissured rock are particularly valuable since

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they provide access to subterranean sites below the frost line. Other features such as old wells, rock and log piles, old building foundations, retaining walls, groundhog burrows and crayfish burrows are examples of hibernation sites. There are no records of hibernation sites; however, there is some potential for them to occur. This feature will be brought forward for further study in the Site Investigation.

Bat Hibernacula

A review of the Renewable Energy Atlas did not identify any known or documented significant bat habitat, such as roosts, maternity sites or caves in the study area.

Caves, karst topography, sinkholes and abandoned mines can provide hibernation habitat for bats. No abandoned mines were identified through a search of Ministry of Northern Development, Mines and Forestry mapping (MNDMF, n.d.) and information provided by MNDMF (**Appendix B**), indicates that there are no known records of karst, caves or abandoned mines in the area. Although it is unlikely that bat hibernacula are present, this type of habitat will be brought forward for confirmation during the site investigation.

Bullfrog Concentration Areas

Bullfrogs inhabit areas in southern and central Ontario. The Study Area is well beyond their northern range. As such, this habitat is not present and will not be brought forward for further study.

Migratory Butterfly Stopover Areas

Significant habitats are only present within 5 km of the Lake Erie and Lake Ontario shorelines. This type of habitat is therefore not present within the vicinity of the Study Area and will not be carried forward for further investigation.

2.9.2 Rare Vegetation Communities

Rare vegetation communities often contain rare species, particularly plants and small invertebrates, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. These communities include areas that contain a provincially rare vegetation community and areas that contain a vegetation community that is rare within the planning area.

FRI mapping was obtained from the MNR (**Figure A3, Appendix A**). The northern edge and northwestern corner of the Project Location is comprised entirely of jack pine and is most likely part of a large plantation that covers much of the surrounding lands. The southeastern corner of the Project Location is part of a poplar and white birch forest that most likely represents an early successional forest community. The disturbed portion of the Project Location includes scattered stands of poplar surrounded by a narrow band of

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jack pine and white birch forest. The surrounding Study Area contains many of the same communities. Lands around the existing diesel generating station are comprised of jack pine (90%) and black spruce (10%). All of these communities are very common in the province. Nonetheless, it is possible that rare vegetation communities may be present which have not previously been identified.

Rare vegetation communities in Ontario include the following:

Alvars

An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. Alvars are not typically found outside the southern Great Lakes Basin and Manitoulin Island. The absence of this type of community will be confirmed through Ecosite Unit Classification (EUC) mapping during the site investigation.

Tallgrass Prairie

A tallgrass prairie has ground cover dominated by prairie grasses. An open tallgrass prairie habitat has <25% tree cover. Tallgrass prairie and savannah were historically common in the near shore areas of the Great Lakes. Tallgrass prairies are not typically found outside the Carolinian forest zone in southern Ontario. The absence of this type of community will be confirmed through EUC mapping during the site investigation.

Savannah

A savannah is a tallgrass prairie habitat that has tree cover between 25 to 60%. Tallgrass prairie and savannah were historically common in the near shore areas of the Great Lakes. Savannahs are not typically found outside the Carolinian forest zone in southern Ontario. The absence of this type of community will be confirmed through EUC mapping during the Site Investigation.

Rare Forest Types

Forests in Ecoregion 3W typically include associations of black spruce, white spruce, balsam fir, trembling aspen, white birch and jack pine (MNR, 2009). Although FRI mapping did not identify any rare forest types, the site investigation will confirm whether any rare forest types may be present which have not previously been identified.

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Talus Slopes

A talus slope is rock rubble at the base of a cliff made up of coarse rocky debris. It is unknown whether this type of habitat is present and, as such, it will be brought forward for further consideration in the site investigation.

Rock Barrens

Rock barrens are open to moderately-treed sites (less than 60% tree cover) characterized by exposed bedrock and very shallow soils. It is unknown whether this type of habitat is present and, as such, it will be brought forward for further consideration in the site investigation.

Sand Barrens

Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Sand barrens are usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%. It is unknown whether this type of habitat is present and, as such, it will be brought forward for further consideration in the site investigation.

Great Lakes Dunes

Great Lakes dunes are open vegetation communities occurring on sand dunes along the shores of the Great Lakes. The Study Area is not located along a Great Lakes shoreline. As such, this type of habitat is not present and this feature will not be brought forward for further study.

2.9.3 Specialized Habitat for Wildlife

Specialized wildlife habitat includes areas that support wildlife species that have highly specific habitat requirements, areas with exceptionally high species diversity or community diversity and areas that provide habitat that greatly enhances species' survival.

Habitat for Area-Sensitive Species

Area-sensitive species are those which require large tracts of suitable habitat for their long-term survival. Based on a review of aerial photography, large woodland expanses and large open water habitats are likely present within the vicinity of the Study Area. The actual size, woodland boundaries, forest maturity and natural vs. plantation status will be confirmed during the Site Investigation.

A review of the OBBA for Square 16CA57 during the 2nd atlas (Bird Studies Canada b, 2001-2005) identified a number of area-sensitive bird species in the vicinity of the Study Area. "Area-sensitive" bird species are identified and described in MNR's *Significant*

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Wildlife Habitat Technical Guide (2000). A list of area-sensitive forest, open water and grassland species observed from within the 10 km x 10 km square that covers the Project Location and its broader vicinity is provided in **Table 6**. The site investigation will confirm if this habitat is present in or within 120 m of the Project Location.

Table 6 Area-Sensitive Species Potentially Present within the Study Area.

COMMON NAME	SCIENTIFIC NAME	SRANK	AREA	Area Sensitive	Habitat Descriptions
FOREST AREA-SENSITIVE SPECIES					
Black-backed Woodpecker	<i>Picoides arcticus</i>	S4	30-40 ha	Yes	Burned over coniferous sites with standing timbre; mature, old growth coniferous forests of mainly cedar-balsam fir; bogs; riparian areas; territories cover 30-40 ha.
Common Goldeneye	<i>Bucephala clangula</i>	S5	1-2 m	Yes	Wetlands, rivers or lakes with deep (~2 m) water; open lakes with nearby woodlands and marshy edges; bulrush in water 1 m deep; breeding distribution depends on availability of trees >30 cm diameter (dbh).
Hairy Woodpecker	<i>Picoides villosus</i>	S5	4-8 ha	Yes	Mixed or deciduous forests; prefer mature trees, but use wide range in size and canopy cover; forest edges; requires a number of tall trees and snags; requires trees >25 dbh; territories cover 4-8 ha.
Hermit Thrush	<i>Catharus guttatus</i>	S5B	N/A	Yes	Boreal forest or Great Lakes-St. Lawrence forest zones; rocky, dry, jack pine forests; dry sandy coniferous or deciduous woods with dense young undergrowth; spruce bogs; borders of wooded swamps and damp forest; brushy pasture; appears to need at least 100 ha of forest in south.
Least Flycatcher	<i>Empidonax minimus</i>	S4B	>100 ha	Yes	Open deciduous woodland or forest edges; orchards; open shrub land; clearing or overgrown pastures of >100 ha.
Magnolia Warbler	<i>Dendroica magnolia</i>	S5B	30 ha	Yes	Mainly mixed and coniferous forests; may be mature trees but require dense shrubs; in mature forests, prefer open areas, edges; disturbed woodland; appears to require about 30 ha in the south.
Ovenbird	<i>Seiurus aurocapillus</i>	S4B	>70 ha	Yes	Undisturbed, open, mature deciduous or mixed forest with closed canopy, little ground vegetation, lots of fallen leaves, logs or rocks; forested ravines or well-drained riverbanks; nests in depression of dead leaves at base of tree or log; area sensitive species, requiring >70 ha of continuous forest.
Red-breasted Nuthatch	<i>Sitta canadensis</i>	S5	>10 ha	Yes	Coniferous and mixed wood forests; nests in a cavity in soft, decaying coniferous wood with dbh >12 cm; requires coniferous components to its habitat most abundant in mature woods and relatively dense forests; nests in interior, requiring at least 10 ha of forest.
Veery	<i>Catharus fuscescens</i>	S4B	>10 ha	Yes	Cool, moist, mixed and deciduous young or disturbed forest with brushy undergrowth and ferns; forest edges; wooded swamps or damp ravines; open woods with dense high undergrowth of ferns, shrubs; shows sensitivity to habitat fragmentation needs at least 10 ha of forest.
Winter Wren	<i>Troglodytes troglodytes</i>	S5B	>30 ha	Yes	Interior species; coniferous forest with hemlock-pine communities; cedar swamps; spruce bogs; deep woods with dense undergrowth; downed wood close to forest streams; nests in cavities of uprooted trees, old stumps, brush piles; nests in soft trees with dbh >10 cm; appears to need at least 30 ha of forest.
Blue-headed Vireo	<i>Vireo solitarius</i>	S5B	100 ha	Yes	Large, mature coniferous or mixed forests of pine, hemlock or spruce with nearly coniferous canopy and dense understory; pine plantations; either closed canopy or where trees are more scattered; require young coniferous or deciduous shrubs for nesting; often associated with swampy areas; territories <1 ha; appears to need about 100 ha of forest in the south.
MARSH/OPEN WATER AREA-SENSITIVE SPECIES					
Common Loon	<i>Gavia immer</i>	S5B, S5N	N/A	Yes	Large bodies of water with stable water levels and little human disturbance; freshwater lakes in open or densely-forested areas; shallow coves of larger lakes; deep marshed; need long stretches of water for takeoff.
OPEN COUNTRY AREA-SENSITIVE SPECIES					
Savannah Sparrow	<i>Passerculus sandwichensis</i>	S4B	>50 ha	Yes	Hayfields, pastures, fields and meadows with dense ground vegetation of grasses and other vegetation of moderate height; moist lowlands and sedge meadows bordered by willows and sweet gale; territory is 1.5 to 2 ha in size; requires tracts of grassland >50 ha.

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Forests Providing a High Diversity of Habitats

Forests with a variety of vegetation communities, numerous vertical layers of vegetation and those with upland and wetland complexes are most likely to support the highest diversity of plant and wildlife species. It is unknown whether highly diverse habitats are present and, as such, this type of feature will be brought forward for further consideration in the site investigation.

Old Growth or Mature Forest Stands

Old-growth forests tend to be relatively undisturbed, structurally complex and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species. It is unknown whether this type of habitat is present and, as such, it will be brought forward for further consideration in the Site Investigation.

Foraging Areas with Abundant Mast

This type of habitat is found within the Great Lakes to St. Lawrence Forest Region where there is a significant supply of fruits and nuts available from species such as beech, red oak and berry-producing shrubs. This type of habitat is not found in Ecoregion 3W and thus it will not be brought forward for further study.

Amphibian Woodland Breeding Ponds

Wetlands and pools within or adjacent to wooded areas are important for many amphibian species. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.

It is unknown whether these habitats exist in or within the Project Location therefore, further studies will be undertaken during the site investigation.

Turtle Nesting Habitat

Ideal turtle nesting habitat must be close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. For an area to function as a turtle-nesting area, it must provide sand and/or gravel that turtles are able to dig in and must be close to water. These sites are often south to south west facing and have maximum exposure to sunlight. Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. The presence or absence of this type of habitat will be confirmed during the Site Investigation.

Specialized Raptor Nesting Habitat

A review of the OBBA for Square 16CA57 during the 2nd atlas identified the potential for American kestrel in the vicinity of the Study Area. Given their known range and habitat preferences, other species of raptor may also be present in the area, such as broad-winged hawk and sharp-shinned hawk. The Forest Management Plan Wildlife

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and Forestry Map shows a raptor nesting site several kilometers from the Study Area on Randolph Lake (**Figure C2, Appendix C**). Given the close proximity of the Project to several lakes and the presence of forest habitat and forest edges, clearings and clear cuts, this feature will be brought forward for further investigation.

Moose Calving Areas

Calving sites are typically somewhat elevated areas that provide isolation, cover and escape routes from possible predators. Islands and peninsulas are often preferred; however shorelines and upland areas may also be used if close to open water. No Moose Calving Areas were identified on the Lake Nipigon Forest Management Plan (**Figure C2, Appendix C**) or on LIO mapping (**Figure A3, Appendix A**). Although no records exist, this type of habitat cannot be excluded from being within the Study Area and will be brought forward for further investigation.

Moose Aquatic Feeding Areas

Moose Aquatic Feeding Areas were identified in the Lake Nipigon Forest Management Plan (**Figure 2C, Appendix C**) and on LIO mapping (**Figure A3, Appendix A**). None are in close proximity to the Study Area, however, there is some potential that this type of habitat may be present in the small ponds and wetlands in the southern portion of the Study Area. As such, this type of habitat will be brought forward for further investigation.

Mineral Licks

Mineral Licks are groundwater upwellings and seepage areas used by moose to replenish sodium in the spring time. Most significant sites are surrounded by forest cover and free of human disturbance. No records were identified from LIO mapping; however, this type of habitat cannot be excluded from being within the Study Area and will be brought forward for further investigation.

Mink, Otter, Marten and Fisher Denning Sites

No records of mink, otter, marten or fisher denning sites could be found, however, there is the potential for some of these species to be present within the Study Areas as they are fairly widespread in the province. This type of habitat will be brought forward for further study during the site investigation.

Highly Diverse Areas

Highly diverse areas provide a large variety of plants and animals. FRI mapping obtained from the MNR does not identify any highly diverse areas. Much of the Project Location and surrounding Study Areas appear to be characterized by pure jack pine plantation stands which have little diversity. However, it is possible that previously unidentified diverse areas may exist so further studies will be undertaken during the site investigation to confirm the presence or absence of this type of habitat.

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Cliffs

A cliff is a vertical to near vertical bedrock >3 m in height. Based on a review of contour mapping, it does not appear as though cliffs are present in the Study Areas. Confirmation will be provided during the Site Investigation.

Seeps and Springs

Seeps and springs are areas where ground water comes to the surface and are often found within headwater areas within forested habitats. It is unknown whether seeps and springs are present in or within the Project Location. Confirmation will be provided during the site investigation.

2.9.4 Habitat for Species of Conservation Concern

Habitats for Species of Conservation Concern include wildlife species that are listed as Special Concern or rare, that are declining or are featured species in the province but does not include those species listed as Threatened or Endangered.

Special Concern and Rare Wildlife Species

Based on a review of the LIO mapping, OBBA and NHIC Biodiversity Explorer, only one rare species is known to inhabit the general vicinity, as listed in **Table 7**. The presence of suitable habitat for the Taiga alpine, a butterfly species, will be confirmed during the Site Investigation.

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Table 7 Species of Conservation Concern

<i>Taxonomy</i>	<i>Common Name</i>	<i>Scientific Name</i>	<i>ESA Status*</i>	<i>S-RANK*</i>	<i>Habitat</i>
Butterflies/ Dragonflies	Taiga Alpine	<i>Erebia mancinus</i>	-	S3	Although usually reported from open black spruce-sphagnum bogs, in Quebec <i>mancinus</i> is more often found in wet, open spruce and tamarack forests around bogs than in open areas. It regularly lands on tree trunks, and is often seen at mud-puddles, rarely at flowers (Government of Canada, n.d.).

*ESA Status- Species status under the Ontario Endangered Species Act

** S-Rank- a general classification indicating species rarity. Species with S-Ranks between S1 and S3 are considered to be rare in the province.

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2.9.5 Animal Movement Corridors

Animal Movement Corridors are elongated areas used by wildlife to move from one habitat to another. They are important to ensure genetic diversity in populations, to allow seasonal migration of animals and to allow animals to move throughout their home range from feeding areas to cover areas.

It is unknown whether this type of habitat is present in the Study Areas. As such, this feature will be carried forward to Site Investigation for confirmation.

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3.0 Summary of Natural Features Carried Forward to Site Investigation

The Records Review identified existing records of a number of significant or potentially significant features within 120 m of the Project Location which will be brought forward for further study in the Site Investigation. In addition, several features will also be brought forward due to a lack of background information and records which did not allow their presence to be ruled out. These include:

- Habitat of Threatened and Endangered Species;
- Unevaluated northern wetlands;
- Candidate Significant Wildlife Habitat, including:
 - Seasonal Concentration Areas of Animals:
 - moose late winter habitat;
 - colonial bird nesting sites
 - waterfowl stopover and staging areas;
 - waterfowl nesting;
 - raptor winter feeding and roosting areas;
 - turkey vulture summer roosting areas;
 - reptile hibernacula; and,
 - bat hibernacula.
 - Rare Vegetation Communities:
 - alvars;
 - tallgrass prairies;
 - savannahs;
 - rare forest types;
 - talus slopes;
 - rock barrens; and,
 - sand barrens.
 - Specialized Habitat for Wildlife:
 - habitat for area-sensitive species;
 - forests providing a high diversity of habitats;
 - old growth or mature forest stands;
 - amphibian woodland breeding ponds;
 - turtle nesting habitat;
 - specialized raptor nesting habitat;
 - moose calving areas;
 - moose aquatic feeding areas;
 - mineral licks;
 - mink, otter, marten and fisher denning sites;
 - highly diverse areas;
 - cliffs; and,

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- seeps and springs.
- Habitat for Species of Conservation Concern:
 - special concern and rare wildlife species.
- Animal Movement Corridors:
 - animal movement corridors.

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4.0 Records Review Conclusions

The Whitesand First Nation Cogeneration and Pellet Mill Project may be located within 120 m of a number of significant or potentially significant natural features. A Site Investigation will be undertaken in accordance with O.Reg. 359/09 to confirm the presence or absence of features identified in this report.

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Natural Heritage Assessment Part II: Site Investigation

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1.0 Site Investigation Report

1.1 Purpose of the Site Investigation

In accordance with the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2012), a Site Investigation includes an investigation of the air, land and water within the vicinity of the Project Location to:

- verify whether the analysis of the Project Location undertaken through the records review is accurate, and make any necessary corrections to the determination in the Records Review Report;
- determine whether any additional natural features exist within the Site Investigation Area, other than those identified in the Records Review Report;
- determine the boundaries of any natural features located within the Site Investigation Area; and,
- determine the distance from the Project Location to the boundaries of any natural features.

1.2 Corrections and Updates to Records Review Information

1.2.1 Changes to the Project Location

Since completion of the Records Review, the site layout was updated to remove lands associated with the Ministry of Transportation works yard and accommodate facility design changes, as shown on **Figure A1** in **Appendix A**. While subsequent site plan changes may occur during detailed design, they will only be made within the limits of the Project Location defined in **Figure A1** of **Appendix A**. Therefore, the measured distances between the natural features and Project components described throughout the remainder of this report are, in effect, the distances between natural features and the Project Location. This provides a conservative approach that accounts for future site plan updates within the Project Location.

1.2.2 Corrections to Information Collected During the Records Review

Work completed during the Site Investigation identified some inaccuracies in Records Review data. In particular, the Forest Resource Inventory (“FRI”) mapping included a number of incorrect forest classifications. More accurate Ecosite Unit Classification mapping is presented on **Figure A4**, **Appendix A**.

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1.3 Methodology

1.3.1 Guidance Documents

The Site Investigation was conducted in accordance with the following documents:

- Natural Heritage Assessment Guide for Renewable Energy Projects, Second Edition (MNR, 2012);
- Terrestrial and Wetland Ecosites of Northwestern Ontario, NWST Field Guide FG-02 (Racey et. al., 1996);
- Ontario Wetland Evaluation System, Northern Manual, 1st Edition, Version 1.2 (MNR, 2013); and,
- Significant Wildlife Habitat Technical Guide & Appendices (MNR, 2000).

1.3.2 Site Investigation Area and Study Area

In accordance with the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2012), the Site Investigation must include the Project Location as well as an area around it, as noted in **Table 8**.

Table 8 Site Investigation Area

Project Component	Site Investigation Area
Construction, installation or expansion of a transmission or distribution line.	At and within 50 m of the Project Location component.
Expansion of an existing transformer station or distribution station.	
Expansion of an existing transportation system.	
General development (i.e. all other types of construction, installation or expansion).	At and within 120 m of the Project Location component.

The Site Investigation focused primarily in these 50 m and 120 m site investigation areas. The 50 m and 120 m site investigation areas are shown on **Figure A1, Appendix A**.

1.3.3 Investigation and Alternative Investigation

The Site Investigation was undertaken from August 20 to August 21, 2013 and included:

- a general site reconnaissance;
- vegetation surveys and Ecosite Unit Classification mapping (Racey et.al., 1996);

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- vegetation surveys to identify the boundaries of wetland features using the *Ontario Wetland Evaluation System for Northern Ontario* (MNR, 2013);
- verification and identification of candidate significant wildlife habitat and natural features as outlined in MNR's *Significant Wildlife Habitat Technical Guide* (2000) and in Part I, Records Review of this report; and,
- incidental wildlife and habitat observations.

The Project Location is on Crown Land. All lands within the footprint of the Project were visited during the Site Investigation. Some lands within the broader Study Area are privately owned and could not be visited (e.g., Hydro One diesel generation station). Areas that were not accessible were studied using an Alternative Investigation, including observations from the nearest accessible vantage point, in combination with aerial photography interpretation.

1.4 Site Investigation Methods

The Site Investigation methods, timing, frequency, locations, weather conditions and specific protocols to be used are summarized in **Table 9**. Field notes are presented in **Appendix D**.

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Table 9 Summary of Site Investigation Methods

Survey Type	Purpose	Summary of Methods	Date(s), Time(s) (Duration)	Weather Conditions
General Site Reconnaissance	<p>To identify man-made or topographic habitat features that may be considered significant for wildlife such as:</p> <ul style="list-style-type: none"> • Caves; • Cliffs; • Abandoned mines; • Abandoned structures; • Old foundations; • Uncapped chimneys; and, • Rock and debris piles. 	<p>Site Investigation: Wandering transects through the Study Area to record any relevant observations.</p> <p>Observers: Hannah Maciver, Terrestrial Ecologist; Dominique Evans, Environmental Technologist</p>	<p>August 20, 2013: 0700-1500 (8 hours)</p> <p>August 21, 2013: 0900-1300 (4 hours)</p>	<p>August 20, 2013: High of 32°C (high humidity, felt like 38°C); partly cloudy becoming clear; wind: 1-2 (Beaufort Scale)</p> <p>August 21, 2013: High of 26°C; clear skies, sunny; wind: 1-2 (Beaufort Scale)</p>
Ecosite Unit Classification	<p>Mapping of vegetation communities and general identification of candidate Significant Wildlife Habitats, such as:</p> <ul style="list-style-type: none"> • Seeps and springs; • Vernal pools; 	<p>Site Investigation: Protocol summarized in Terrestrial and Wetland Ecosites of Northwestern Ontario (Racey et. al., 1996), including visual searches for habitat features, using binoculars where necessary.</p>	<p>August 20, 2013: 0700-1500 (8 hours)</p> <p>August 21, 2013: 0900-1300 (4 hours)</p>	<p>August 20, 2013: High of 32°C (high humidity, felt like 38°C); partly cloudy becoming clear; wind: 1-2 (Beaufort Scale)</p> <p>August 21, 2013: High of 26°C; clear skies, sunny; wind: 1-2 (Beaufort Scale)</p>

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Survey Type	Purpose	Summary of Methods	Date(s), Time(s) (Duration)	Weather Conditions
	<ul style="list-style-type: none"> Stick nests; Dens; Water bodies; and, Other wildlife habitats. 	Observer: Dominique Evans, Environmental Technologist		
Wetland Boundary Delineation (if required)	To confirm the boundaries of any wetlands in the Study Area, if wetlands are present.	<p>Site Investigation: Boundary delineation in accordance with the Ontario Wetland Evaluation System for Northern Ontario (MNR, 2013), using binoculars where necessary. Boundary will be marked using a hand-held GPS unit.</p> <p>Observer: Dominique Evans, Environmental Technologist</p> <p>Alternative Investigation: Wetland communities viewed from roadside or closest adjacent property boundary in combination with air photo interpretation and existing FRI mapping.</p>	<p>August 20, 2013: 0700-1500 (8-hours)</p> <p>August 21, 2013: 0900-1300 (4 hours)</p>	<p>August 20, 2013: High of 32°C (high humidity, felt like 38°C); partly cloudy becoming clear; wind: 1-2 (Beaufort Scale)</p> <p>August 21, 2013: High of 26°C; clear skies, sunny; wind: 1-2 (Beaufort Scale)</p>

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Survey Type	Purpose	Summary of Methods	Date(s), Time(s) (Duration)	Weather Conditions
Incidental Wildlife and Habitat Observations	To document any incidental species observations made during all field investigations.	<p>Site Investigation and Alternative Investigation: All observations of wildlife, signs of wildlife (footprints, scat, etc.), flora and fauna species of conservation concern.</p> <p>Observers: Hannah Maciver, Terrestrial Ecologist; Dominique Evans, Environmental Technologist</p>	<p>August 20, 2013: 0700-1500 (8 hours)</p> <p>August 21, 2013: 0900-1250 (4 hours)</p>	<p>August 20, 2013: High of 32°C (high humidity, felt like 38°C); partly cloudy becoming clear; Beaufort wind scale: 1-2</p> <p>August 21, 2013: High of 26°C; clear skies, sunny; Beaufort wind scale: 1-2</p>

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2.0 Results of the Site Investigation

2.1 General Description of the Study Area

2.1.1 Landform and Topography

According to the *Northern Ontario Engineering Geology Terrain Study* (McQuay, 1981), the Project Location is characterized by sandy, gravelly soils with relatively flat topography. A glacial spillway feature is located to the southeast which forms a small valley. Sandy and gravelly soils ensure that the site is dry. No surface water drainage feature is present in the valley. Landform and topography are summarized in **Table 10**.

Table 10 Landform and Topography

Attribute	On-Site Description
Landform (Dominant)	Outwash plain/valley train
Landform (Subordinate)	Bedrock knob
Material	Sand, gravel
Topography (Local Relief)	Mainly low local relief
Topography (Variety)	Plain, kettle/pitted, knobby/hummocky
Drainage	Dry

(McQuay, 1981)

Observations made in the field were consistent with this description.

2.1.2 Surface Water and Drainage

There are no watercourses or other surface water features at, or within 120 m of the Project Location. Several small ponds and wetlands are present just beyond 120 m of the Project Location, as shown on **Figure A4, Appendix A**.

2.1.3 Ecosite Unit Classification

The Project Location is comprised of a former forestry camp, plantations and a small portion of a mature forest. Surrounding lands include an active gravel pit, both naturalized and plantation landscapes, as well as a number of wetlands and ponds.

A site reconnaissance was undertaken on August 20 and 21, 2013. Ecosite Unit Classification (EUC) of the broad vicinity was completed based the *Terrestrial and Wetland Ecosites of Northwestern Ontario* (Racey et. al., 1996). Ten vegetation and cultural communities were identified. Soils data was not collected during the site reconnaissance; however, information was obtained from previously dug test pits.

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A summary of the EUC units identified within the Project Location and its vicinity is provided below and delineated on **Figure A4, Appendix A**.

2.1.3.1 Non-forested Terrestrial Ecosite

Prairie/Savannah, ES10

There was a single pocket of open meadow within the 120 m study area. Due to the limitations of the Terrestrial and Wetland Ecosites of Northwestern Ontario (Racey et. al., 1996) there are no keys or classification for meadow communities. Although this area has been identified as a prairie/savannah, the species and diversity would not meet the criteria.

The area was historically used as a staging or landing area for the former forestry operations. The site contained sheep-laurel (*Kalmia angustifolia*), pearly everlasting (*Anaphalis margaritacea*), wild strawberry (*Fragaria virginiana*), alsike clover (*Trifolium hybridum*), timothy (*Phleum pratense*), red top (*Agrostis gigantea*), dandelion (*Taraxacum officinale*), fireweed (*Chamerion angustifolium*), ox-eye daisy (*Leucanthemum vulgare*) and sow thistle (*Sonchus arvensis*).

2.1.3.2 Forested and Wetland Ecosites

Black Spruce-Jack Pine: Very Shallow Soil, ES12

This community occurred along two steep slopes that extended into the ponds located south of the Project Location, adjacent to the gravel pit as shown in **Figure A4, Appendix A**. The canopy was very open and dominated with black spruce (*Picea mariana*) with lesser Jack pine (*Pinus banksiana*). White birch (*Betula papyrifera*) and trembling aspen (*Populus tremuloides*) were located sporadically in the sub canopy. Both of these areas contained heavy blow down and evidence of some select thinning.

Jack Pine-Conifer: Dry-Moderately Fresh, Sandy Soil, ES13

These communities were located in previously harvested areas in the Project Location as well as the surrounding study area, thus resulting in even aged stands. The canopy was dominated by Jack pine with rare observations of black spruce and white birch. There was a heavy layer of slash material throughout the entire community which hindered understory species.

Pine-Spruce Mixedwood: Sandy Soil, ES14

This community type is located both within and immediately adjacent to the Project Location. The largest portion of this community type was identified both within and to the north and east of the Project Location. The soils in these areas were found to be well drained sand. These areas appear to have been selectively harvested in the past and contain some slash, but did have a broader range of shrubs and ground cover

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including speckled alder (*Alnus incana*), sheep-laurel, St. John's wort (*Hypericum perforatum*) and a variety of lichens and mosses.

A small pocket of this community was also identified well beyond 120 m from the Project Location, see **Figure A4, Appendix A**. This small pocket contained a large amount of blow down that was negatively impacting the quality and quantity of the shrub and ground cover.

Hardwood-Fir-Spruce Mixedwood: Sandy Soil, ES16

The former forestry camp contained a large unharvested area. The area was dominated by trembling aspen with lesser amounts of black spruce, Jack pine and white birch. There were a number of shrubs and ground covers as the canopy was fairly open. Speckled alder, birds foot trefoil (*Lotus corniculatus*), St. John's wort, fireweed, yarrow (*Achillea millefolium*), wood anemone (*Anemone nemorosa*), wild sasparilla (*Aralia nudicaulis*) and bunchberry (*Cornus canadensis*) were found throughout, while dandelion and alsike Clover were found along the fringes.

The rest of the forestry camp contained vacant trailers, fuel storage tanks, various vehicles, storage sheds and various gravel roads.

Rich Swamp: Cedar (Other Conifer): Organic Soil, ES37

Located adjacent to pond five was a forested wetland community dominated by black spruce, see **Figure A4, Appendix A**. The community was located along a shallow slope leading to a pond and was very hummocky with completely saturated soils. It also contained a large number of standing snags along with a large variety of mosses and lichens. Species included trout lily (*Erythronium americanum*), wild currant (*Mahonia trifoliolata*), bunchberry, Labrador tea (*Ledum groenlandicum*), false pixie cup (*Cladonia chlorophaea*) and an unidentified brown sphagnum.

Thicket Swamp: Organic-Mineral Soil, ES44

Dominated with Labrador tea thicket community contained blueberry (*Vaccinium myrtilloides*), snowberry (*Symphoricarpos albus*), red raspberry (*Rubus idaeus*), willow, bog-laurel (*Kalmia polifolia*), prickly wild rose (*Rosa acicularis*), red osier dogwood (*Cornus sericea*), speckled alder, mountain fly honeysuckle (*Lonicera villosa*), bunchberry as well as young trembling aspen and white spruce.

There was evidence that the community had been harvested in the not too distant past as there was a large amount of slash located throughout the community.

Meadow Marsh: Organic-Mineral Soil, ES46

Two areas of meadow marsh were located in the areas identified as pond four and the wetland just south of pond two. These communities were comprised of a vegetated

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“island” area surrounded by open water, see **Figure A4, Appendix A**. The vegetated areas were dominated by grasses with water smartweed (*Persicaria amphibia*) and bog-laurel located in the more open water areas.

A black bear (*Ursus americanus*) was observed in the community at Pond 4 well outside the 120 m Study Area. Due to its aggressive behaviour and the location of this community a full assessment of the community was not possible.

2.1.3.3 Sparsely Vegetated Shallow Water Ecosites

Shallow Water: Sparsely Vegetated: Muck, ES52

Pond five and the connected pond to its north had a muck substrate with very clear waters. The shorelines were well defined and there was little submergent and floating vegetation. Species noted included arrowhead (*Sagittaria latifolia*) and submergent grasses.

Shallow Water: Sparsely Vegetated: Sand, ES53

Ponds one, two and three contained waterlily (*Nymphaeaceae sp.*), arrowhead, water-smartweed and submergent grasses. The ponds were well defined and were surrounded by steep, well vegetated slopes. Pond two was connected to the Meadow Marsh, ES46, with a small channel approximately 5 m long and approximately the same width, see **Figure A4, Appendix A**.

2.1.4 Incidental Species and Habitat Observations

Incidental wildlife and habitat observations were recorded during field investigations conducted on August 20 to August 21, 2013. A complete list of species observed is included in **Appendix E**. A total of twenty-seven (27) birds, eight (8) mammals, two (2) herpetofauna, and three (3) Lepidoptera were observed.

Field investigations were conducted outside of the breeding bird window, thus avian observations are considered “incidental”, however suitable breeding habitat for many species observed is present within the Study Area or in the greater vicinity of the Study Area. Mixed flocks of migratory songbirds were observed foraging together utilizing the vegetation and water bodies for food supply as they prepare to migrate south; other avian species observed are likely year-round residents which typically remain in Ontario during the winter period such as American crow (*Corvus brachyrhynchos*), black-capped chickadee (*Poecile atricapillus*), blue jay (*Cyanocitta cristata*), common raven (*Corvus corax*), and gray jay (*Perisoreus canadensis*).

Incidental observations or signs/tracks of other wildlife species utilizing habitat within the Study Area include: wolf, red fox (*Vulpes vulpes*), snowshoe hare (*Lepus americanus*),

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eastern chipmunk (*Tamias striatus*), red squirrel (*Tamiasciurus hudsonicus*), beaver, moose, and black bear. None of these species are considered rare, and are common and expected for the area.

Water bodies present outside of the Project Location have obvious signs of beaver use (e.g., lodges, dams, trails, vegetation gnawing). Submergent/emergent/floating vegetation, sandy/mucky bottoms, woody debris and logs present in these ponds/wetlands provide refuge, basking, breeding and hibernation opportunities for a variety of common amphibians and possibly reptiles (such as western painted turtle). Large mammals also appear to be utilizing these water bodies, or habitat directly adjacent to these water bodies. Moose bedding signs were present in two of the wetlands, as well as tracks around and within the ponds/wetlands, and browsing of vegetation adjacent to these water bodies. A cow and calf and black bear were observed adjacent to pond four at the far eastern end of the Study Area. These water bodies also attract a variety of *Odonata* (not identified to species).

Dead standing tree snags are present throughout the Study Area which provide habitat for a variety of wildlife, in particular birds. Tree snags are often used as prominent foraging perches and in particular for tree cavity nesters such as some species of woodpeckers, waterfowl and songbirds. Some species of smaller mammals may also utilize these cavities for refuge and nesting.

Woody piles of debris, as well as some piles of rocky cobble are found throughout the Study Area, but were particularly common within the Project Location. These provide suitable wildlife refuge for snakes and small mammals. Snakes may use these piles of wood or cobble for hibernation, gestation, thermoregulation, and as a source of food supply should small rodents be present.

A few species of *Lepidoptera* were observed during field observations. These include: Atlantis fritillary (*Speyeria atlantis*), *Colias* spp., and *Polygonia* spp. Atlantis fritillary was the most common species of butterfly observed during field investigations. Habitat for all of these species is common throughout the Study Area and greater vicinity, as they are typically found in a wide variety of habitats such as forest openings, pastures, wetlands, meadows.

2.2 Significant and Candidate Significant Natural Features Identified During Site Investigation

2.2.1 Habitat of Threatened and Endangered Species

Work completed during the Records Review identified the potential for woodland caribou *Rangifer tarandus caribou*, to be present in the Study Area. Forest-dwelling woodland

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caribou require large continuous tracts of undisturbed mature to old-growth coniferous forest habitat to thrive. Their preferred habitat also features abundant lichens, muskegs or peat lands intermixed with upland or hilly areas. They tend to avoid early stage, successional forests and recently disturbed areas which have poor feeding options, impede movement, and attract other ungulates (such as deer or moose) (Environment Canada, 2012).

The majority of the Project Location is located within a highly disturbed former logging camp. The adjacent areas have been cleared in the last two decades for forestry operations and replanted with jack pine. A number of gravel roads surround the perimeter and central portion of the site. The southern and eastern portion of the Project Location features mature mixed forest habitat with moderate shrub and ground cover. Some lichen ground cover was observed within this forested habitat, however not as a dominant feature. Similar features also comprise the broader vicinity of the Project Location, which includes several ponds/wetlands, an active aggregate pit, a natural forested ridge that runs north-south approximately 300 m from the Project Location along the far eastern side and an MTO patrol yard and Hydro One diesel generating station at the northwest corner.

According to the General Habitat Description for the Forest-dwelling Woodland Caribou (MNRc, n.d.), this species' regulated range extends across much of northern Ontario. Habitat is classified into three categories, as follows:

- Category 1: nursery areas, winter use areas, travel corridors;
- Category 2: seasonal ranges; and,
- Category 3: remaining areas within the range.

Given the lack of suitable continuous tracts of mature coniferous forest and the nature of disturbance at the Project Location and surrounding Study Area, the site is considered to provide Category 3 habitat only. No evidence of nursery areas, winter use areas, travel corridors or other seasonal use areas for caribou were observed. It is also evident that moose are common in the area given the observations and signs observed throughout the Study Area. Typically moose and caribou do not coexist. In speaking with knowledgeable individuals from Whitesand First Nation during field investigations, woodland caribou have not been recently observed in the vicinity of the Study Area (pers. comm., August 20, 2013). As such, the area provides only indirect habitat which may be used incidentally from time to time but not on a regular basis.

Although it is not prime habitat, Category 3 habitat is regulated under the General Habitat provisions of the *Endangered Species Act*. As such, habitat for this species is present and is considered to be significant and is identified on **Figure A5, Appendix A**.

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Further discussion regarding potential impacts to this habitat and associated mitigation are provided in the Environmental Impact Study in Part IV of this report.

In the Records Review portion of this report, a record of possible barn swallow breeding was identified in the vicinity of the Project Location. As barn swallows tend to nest in human-made structures, a thorough investigation was completed in and around the trailers and other structures present at the former logging camp site. No evidence of nests or barn swallow presence was observed. Although the trailers are abandoned and offer shelter, barn swallows tend to prefer wooden or concrete materials, rather than metal and this could account for their lack of presence on the site. At the MTO works yard on the adjacent property to the west, there was a large storage shed with a wide open entrance. Feathers were seen at the entrance but they appeared to be from rock pigeon, *Columba livia*, rather than barn swallow. No nests were observed within the shed.

No habitat for any other Threatened or Endangered species currently listed under the provincial *ESA, 2007* was observed during the Site Investigation.

2.2.2 Unevaluated Northern Wetlands

The Records Review identified the potential for several unevaluated wetlands to be located within the Study Area. During the Site Investigation, wetland boundaries were delineated and it was determined that all wetlands are located greater than 120 m from the Project Location. As such, wetlands will not be brought forward further study in the Evaluation of Significance.

2.2.3 Candidate Significant Wildlife Habitat

2.2.3.1 Seasonal Concentration Areas of Animals

Moose Late Winter Habitat

Dense stands of mature conifer with good overhead cover were not observed within the Study Area, therefore moose late winter habitat is not considered present. No further consideration of this habitat type will be undertaken.

Colonial Bird Nesting Sites

Several ponds/wetlands are present beyond 120 m of the Project Location. None of these units feature suitable nesting for herons (i.e., no dead standing trees present with nests) or gulls and terns (i.e., no rocky islands or peninsulas within a large lake or river are present). Suitable nesting habitat for swallows was also not present (i.e., banks, cliffs, man-made structures adjacent to open fields). Therefore, nesting habitat for colonial birds is not considered present within the Study Area. No further study or evaluation of significance will be undertaken.

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Waterfowl Stopover and Staging Areas

A small number of waterfowl (four bufflehead, *Bucephala albeola* and three ring-necked duck, *Aythya collaris*) were observed in the various small ponds in the broad vicinity of the Project Location. Ponds are relatively small, ranging in size from 0.33 ha to 0.90 ha, and are unlikely to support migrating waterfowl in the concentrations required for the habitat to be considered significant (typically more than 100 or more individual waterfowl for seven days). Furthermore, none of these ponds are located within 120 m of the Project Location.

As such, this type of habitat is not present and no further assessment is required.

Waterfowl Nesting

Suitable nesting habitat for waterfowl may be present in ponds two, three and four. These ponds are characterized by emergent vegetation around the edges with floating vegetation throughout. Mature trees with some cavities are evident along the edges which could provide nesting opportunities. Both of these ponds and the surrounding nesting sites are beyond 120 m of the Project Location. Pond one does not exhibit the same characteristics. It is more open, without emergent vegetation and therefore provides far less protection to nesting waterfowl. Surrounding trees are less mature and do not provide significant cavity nesting opportunities. As such, this pond does not provide suitable waterfowl nesting habitat.

This type of habitat is therefore not present and will not be assessed further.

Raptor Winter Feeding and Roosting Areas

One American kestrel was observed during field investigations within the Project Location. Suitable winter feeding and roosting areas include mature forest with roosting trees in combination with large open areas where raptors can hunt for prey during the winter months. According to the *Significant Wildlife Habitat Technical Guide* (MNR, 2000), open areas should be at least 25 to 30 ha in size.

Open, disturbed areas associated with the former logging camp site could provide some winter hunting opportunities for raptors; however the open area is relatively small (approximately 5.8 ha) and therefore does not provide suitable habitat.

Based on the insufficient size of suitable open areas, this type of habitat will not be assessed further.

Turkey Vulture Summer Roosting Areas

One turkey vulture (*Cathartes aura*) was observed flying overhead within the Study Area, however no roosting areas were observed during field investigations. Given the low

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number of individuals observed, turkey vulture summer roosting areas are not considered present within the Study Area.

No further assessment of this habitat will be undertaken.

Reptile Hibernacula

The Project Location features a former logging camp which contains a number of scattered piles of cobbles, woody piles of debris and wells/abandoned raised trailers that likely provide temporary refuge for rodents and snakes. However, the debris appears to be at the ground surface and does not extend below the frost line. As such, the debris is unlikely to provide suitable hibernation opportunities. Other more suitable locations may be located within the gravel pit that is beyond 120 m of the Project Location. One eastern garter snake (dead on road) was observed along the gravel road leading to the aggregate pit.

Due to the lack of suitable habitat extending below the frost line, reptile hibernacula are not considered to be present and this type of habitat will not be further assessed.

Bat Hibernacula

There is no suitable habitat present for bat hibernacula within the Study Area. Features such as caves, karst topography, sinkholes or abandoned mines are not present in the Study Area.

No further consideration of this habitat type is warranted.

2.2.4 Rare Vegetation Communities

Rare vegetation communities include:

- alvars;
- tallgrass prairies;
- savannahs;
- rare forest types;
- talus slopes;
- rock barrens; and,
- sand barrens.

Based on Ecosite Unit Classification conducted during the Site Investigation, none of these vegetation community types are present. As such, none of these features will be impacted by the proposed development and there is no further need to study these features.

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2.2.5 Specialized Habitat for Wildlife

Habitat for Area-sensitive Species

Five species were observed during field investigations completed by Neegan Burnside in 2013 that are considered “area-sensitive” by MNR (2000):

- black-and-white warbler (*Mniotilta varia*);
- magnolia warbler (*Setophaga magnolia*);
- common loon (*Gavia immer*);
- least flycatcher (*Empidonax minimus*); and,
- red-breasted nuthatch (*Sitta canadensis*).

It should be noted that surveys were not conducted during the appropriate breeding bird survey period. While some species observed may be local breeders or permanent year-round residents (i.e., red-breasted nuthatch), other species such as warblers and flycatchers that were observed in mixed flocks of post-breeding songbirds, will often utilize different types of habitat prior to and during migration compared to the breeding season. Habitat descriptions provided in the MNR technical guide for species considered “area-sensitive” generally apply to habitat needs during the breeding season.

Based on known breeding habitat requirements, suitable breeding habitat may be present for black-and-white warbler, magnolia warbler, red-breasted nuthatch and least flycatcher within the Study Area. With the exception of least flycatcher, the other three species typically favour mature mixed or coniferous forests. These features are present both at the Project Location in the forested area south and east of the former logging camp. These features are also present beyond the Project Location where there are larger tracts of mixed forest habitat that will not be impacted by the proposed works.

Least flycatcher breeds in a variety of more open deciduous forest types, forest clearings and pine plantations generally greater than 100 ha in size. Suitable breeding habitat is present for this species within the Project Location and greater Study Area.

Common loon was observed as a migrating individual flying overhead of the Study Area and therefore would not be considered breeding or utilizing the habitat present within the Study Area. Pond and marsh habitats are not large enough to support area-sensitive marsh species.

Although there is some open country habitat present in and around the old logging camp site where lands have been cleared, the area is small (approx. 5.8 ha), disturbed and not suitable for area-sensitive grassland species.

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As such, habitat for area-sensitive grassland and marsh species is not present. Large forest tracts are present that meet the needs of forest area-sensitive species. However, the *Significant Wildlife Habitat Technical Guide* (MNR, 2000), recommends considering the broad planning area and greater landscape when determining the presence of this type of habitat. This type of habitat is more applicable to southern Ontario than northern Ontario where large forested communities are extensive.

The region around the Project Location is well forested. Furthermore, the *Significant Wildlife Habitat Technical Guide* notes that, "Natural forests stands containing a diversity of forest tree species and structure would be more significant than the same sized forest stand composed of a single species" (pg. 77). The Project Location itself is characterized to a large extent by second growth jack pine plantation as a result of previous timber harvesting operations. Other forests present do not provide any significant diversity, unique features or old growth characteristics that would differentiate them from other woodland units in the area.

As such, it is our opinion that habitat for area-sensitive species is not applicable to the Study Area and will not be subject to further consideration or assessment.

Forests Providing a High Diversity of Habitats

As previously noted, the majority of the study area was used for forestry operations, including a camp, and logging area. Due to the nature of the reforested areas, diversity is low throughout the study area. This type of habitat is therefore not present and will not be further assessed.

Old Growth or Mature Forest Stands

Due to the previous harvest of the Project Location and surrounding areas, there are no areas of old growth or mature forest stands present in the study area. This type of habitat is therefore not present and will not be further assessed.

Amphibian Woodland Breeding Ponds

Each of the ponds one through five, may support amphibian woodland breeding. Each pond appeared to be inhabited by frogs or toad (not identifiable to the species) based on observations during field surveys. One species was identified, American toad (*Bufo americanus*), and was observed in vicinity to one of the ponds to the south of the Project Location.

None of the ponds are within 120 m of the Project Location and thus this type of habitat will not be assessed in further detail.

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Turtle Nesting Habitat

As discussed under Amphibian Woodland Breeding Ponds, several ponds are present which may provide habitat. Ponds two, three and four feature emergent vegetation, fallen tree snags and logs suitable for basking and adjacent woodland habitat for refuge. However, none are within 120 m of the Project Location. No turtles were observed during the Site Investigation.

Turtle nesting habitat may also be present along the road shoulder adjacent to ponds one, two and three and the gravel pit to the south of the Project Location. The road shoulder in this area is characterized by sandy/gravelly deposits. This pit area also appears to feature well-drained sand and well-sorted gravel deposits that are dry to moderately fresh, coarse to fine sandy.

Although turtle nesting may occur in these areas, the Significant Wildlife Habitat Technical Guide (MNR, 2000, pg. 47) indicates that, “the best nesting sites are close to water and away from roads” and furthermore, that roadsides “are not preferred sites” (pg. 80).

As such, preferred turtle nesting habitat is not present and no further consideration of this habitat type will be provided.

Specialized Raptor Nesting Habitat

No raptor nesting habitat was identified during field investigations. One raptor, American kestrel, was observed within the Project Location; however surveys were not conducted during the breeding season. Other species which may be present include broad-winged hawk and sharp-shinned hawk. Raptor stick nests are typically found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests or plantations within the tops or crotches of trees.

No stick nests or other evidence of raptor nesting was observed during the Site Investigation.

Therefore, this type of habitat is not present and will not be further assessed.

Moose Calving Areas

No moose calving areas were identified by MNR as being present within the Study Area. Additionally, features preferred by moose for calving such as islands and peninsulas, are not present within the Study Area, therefore, moose calving areas are not considered present. This type of habitat will not be further assessed.

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Moose Aquatic Feeding Areas

There are no ponds or wetlands present at, or within 120 m of, the Project Location. According to MNR (2000), ideal sites provide abundant food, particularly pondweeds, water milfoil, and yellow water-lily, and have adjacent stands of lowland conifers to provide shade and hiding cover. Pond four and the small marsh connected and immediately south of pond two (identified as ES46-Meadow Marsh on **Figure A4, Appendix A**) may provide suitable conditions. Both features are well beyond 120 m from the Project Location. During the Site Investigation, recent signs and observations of moose were recorded in the vicinity of all five ponds (tracks, browsing along adjacent shorelines, bedding, and a cow and yearling). However, aquatic feeding habitat is not present within 120 m of the Project Location.

No further consideration of this habitat is warranted.

Mineral Licks

Mineral licks are difficult to identify in the field because they are considered rare and typically are surrounded by forest cover and free of human disturbance (MNR, 2000). Because they are thought to occur most frequently in areas of sedimentary and volcanic bedrock, mineral licks likely do not occur within 120 m of the Project Location. The Study Area is underlain by Precambrian bedrock deposits with a discontinuous glacial drift overburden, with sandy/silty sedimentary deposition overlying ground moraine (Scott Hamilton, 2013).

Additionally, upwelling of groundwater and seepage areas are typically what attract moose to these mineral licks. While the ponds in the vicinity are thought to be fed by groundwater, no upwellings or seepage areas were observed. Therefore, mineral licks are considered absent from the area.

No further assessment of this habitat type will be undertaken.

Mink, Otter, Marten and Fisher Denning Sites

Denning sites for all of these mammals are usually very difficult to find as they are usually underground or in old beaver/muskrat lodges, log jams and crevices in rock piles, or in the case of fishers, cavities in large dead or living trees or fallen logs (MNR, 2000). These species will utilize shorelines dominated by coniferous or mixed forests for feeding and denning with abundant shrubby vegetation and downed woody debris. In the case of otters, they require shoreline habitats that support large, productive fish populations (2000).

Otter habitat can be ruled out of the Study Area, as there are no water bodies present that contain any type of significant fish habitat. There may be suitable denning sites for mink, marten and fisher adjacent to the shorelines of small ponds; however none are

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located within 120 m of the Project Location. As such, no further consideration is warranted.

Highly Diverse Areas

As previously noted, due to the nature of the reforested areas, diversity is low throughout the study area. No further assessment is warranted.

Cliffs

Cliff features are not present in the Study Area and will not be further considered.

Seeps and Springs

While the small ponds within the broad vicinity of the Project Location are thought to be fed by groundwater, no exposed upwellings or seepage areas were observed. These ponds are all located beyond 120 m of the Project Location. As such, seeps and springs are not present and will not be further assessed.

2.2.6 Habitat for Species of Conservation Concern

The Records Review identified a record for Taiga alpine (*Erebia mancinus*), a butterfly species, which has a provincial rank of S3 (vulnerable). None were observed during field investigations. The preferred habitat features for this species are not present within the Study Area (i.e., open black spruce-shagnum bogs, open spruce and tamarack forests around bogs). Habitat for this species is, therefore, not present.

Two rare species were observed during the Site Investigation:

- Olive-sided Flycatcher, *Contopus cooperi*, listed provincially as Special Concern under the ESA 2007; and,
- Eastern Wood-Pewee, *Contopus virens*, listed as Special Concern by COSEWIC and ESA 2007.

Olive-sided Flycatcher was observed within the forest in proximity to ponds one, two and three. Olive-sided Flycatcher prefers natural coniferous or mixed forest edges and openings and areas where forests have been logged or burned provided there are tall snags and trees present for foraging perches, preferably adjacent to water bodies. Suitable habitat is present within the pine plantation identified as ES13, Jack Pine-Conifer Ecosite on **Figure A4, Appendix A**. Most preferred habitat is located south and east of the Project Location in the vicinity of the ponds, as shown on **Figure A5, Appendix A**.

Eastern Wood-Pewee (*Contopus virens*) was recorded during field investigations. Eastern Wood-Pewee prefers deciduous and mixed woodland habitat that feature

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openings along forest edges, clearings, water, etc. A single singing male was heard from within the mixed forested area that is located east of the existing logging camp near pond five. While this species was not recorded within the Project Location, suitable breeding habitat is present throughout the ES14, Pine-Spruce Mixed Wood forest unit which is present at the Project Location and within its 120 m vicinity.

As such, habitat for species of conservation concern encompasses much of the southern and eastern portions of the Project Location, as shown on **Figure A5, Appendix A**. The significance of this habitat is yet to be confirmed as observations were made outside of the breeding bird season. This habitat is considered to be candidate significant habitat only at this time. It will be brought forward to the Evaluation of Significance in Part III of this report for further consideration and assessment.

2.2.7 Animal Movement Corridors

There are no significant deer habitats in the vicinity of the Project Location that would encourage deer to migrate to or from the area.

A potential moose aquatic feeding area was identified in the small ES46 marsh south of pond two. Other evidence of moose, including a bedding site and observation of a moose and calf were noted throughout the natural glacial spillway valley to the south east of the Project Location (**Figure A4, Appendix A**). However, **Figure C2 in Appendix C** indicates that there are no known moose habitats east of pond two that would encourage moose to travel eastward through the valley. **Figure C2** shows a large number of moose aquatic feeding areas to the west and north of the Project Location. No known moose habitats are located to the west. As such, the valleyland does not link any significant moose habitats and is unlikely to provide an important corridor for them.

There is potential amphibian woodland breeding habitat within ponds one, two and three south of the Project Location as well as within ponds four, five and six to the north. Upland habitat is present immediately adjacent to each pond and it is not necessary for amphibians to travel through the valley to reach foraging habitat. The valleyland has been significantly modified through logging and reforestation practices. It also includes an unmaintained and rarely used former logging road. Although the area is regenerating, it does not currently provide prime habitat conditions. At the west end of the valley there are a number of active mine claims as well as an active aggregate extraction permit, as shown on **Figure C3, Appendix C**.

During the site investigation black bear, *Ursus americanus*, were observed within the valley, along with other signs of their presence, including tracks and scat. However, no significant habitats for bear are known or were observed in the vicinity of the valley that would entice bears to use it regularly for travel purposes.

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In summary, the valley feature does not provide a link between any significant habitat areas and is not considered to provide an important animal movement corridor. No further assessment of this habitat type will be undertaken.

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3.0 Summary of Natural Features

Work completed during the Site Investigation, identified two significant and candidate significant natural features at, and within 120 m of, the Project Location. These include:

- Significant habitat for Threatened and Endangered species; and,
- Candidate habitat for species of conservation concern.

Each is described further in **Table 11**.

Table 11 Summary of Significant and Candidate Significant Natural Features Present

Habitat Type	Feature Description	Significance Level	Distance between feature and Project Location	Carry forward to EOS?
Significant habitat for Threatened and Endangered Species	Regulated habitat for woodland caribou (Category 3) is present.	Known significant based on General Habitat protection	0 m Habitat covers entire Project Location and beyond	Y
Candidate habitat for species of conservation concern	Mature forests and plantations in proximity to the small ponds may provide habitat for Olive-sided Flycatcher and Eastern Wood-Pewee. Candidate habitats encompass portions of the Project Location and lands within its 120 m vicinity.	Candidate	0 m Habitat covers entire Project Location and beyond	Y

Each of these features will be brought forward for further assessment in the Evaluation of Significance; Part III of this report.

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Natural Heritage Assessment Part III: Evaluation of Significance

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1.0 Evaluation of Significance

1.1 Purpose of the Evaluation of Significance

The purpose of the Evaluation of Significance (“EOS”) is to:

- Determine if a feature identified during the Site Investigation is:
 - provincially significant;
 - significant; or,
 - not significant.
- Determine, based on Appendix D of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2012), if a feature:
 - must be evaluated;
 - can be treated as significant; or,
 - can be treated as significant as an interim measure and evaluated at a later date.

1.2 Evaluation of Significance Methodology

The EOS was conducted as a desktop exercise and included a review of criteria listed in the following documents:

- Significant Wildlife Habitat Technical Guide (MNR, 2000); and,
- Appendix D: Process for Identifying and Addressing Significant Wildlife Habitat in Natural Heritage Assessment Guide for Renewable Energy Projects, Second Addition (MNR, 2012).

No fieldwork was conducted as part of the initial EOS in 2013.

The initial EOS was prepared by:

- Tricia Radburn, Environmental Planner, Neegan Burnside; and,
- Hannah Maciver, Terrestrial Ecologist, Neegan Burnside.

Subsequent fieldwork was conducted by Northern Bioscience Ecological Consulting in June 2014, as documented in Appendix G.

Based on the findings of the 2014 fieldwork, the EOS was finalized by:

- Nicholle Smith, Senior Terrestrial Ecologist, Neegan Burnside.

CVs are provided in **Appendix F**.

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1.3 Significance Classification

In accordance with provincial guidelines (MNR, 2012), the significance of features can be described as follows:

- Features which have previously been evaluated using provincial criteria and standards which have shown them to be provincially significant. These features will maintain their provincially significant status and will be brought directly through the Evaluation of Significance (“EOS”) to the Environmental Impact Study (“EIS”).
- Features which have the potential to be provincially significant but which have not previously been evaluated. These features are evaluated in the EOS and brought forward to the EIS only if they are found to be provincially significant or significant, with the exception noted below.

With respect to wildlife habitat, provincial guidelines allow unevaluated candidate habitat to be treated in different ways, depending on its location relative to specific portions of the project (i.e., roads vs. buildings, etc.), as described in **Appendix D** of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2012). Specifically, candidate habitat features can be treated in one of the following ways:

- They can be assessed and their significance determined through the Evaluation of Significance.
- They can be identified as candidates for provincial significance which will be treated as significant. In this case, they will not be studied in detail in the EOS as they will simply be assumed to be significant. They will be identified as “Generalized Candidate Significant Wildlife Habitat” and will be brought directly through the EOS to the EIS where general construction mitigation will be provided in order to ensure their protection.
- In other instances, they may be identified as candidate habitat but a detailed investigation during the EOS is not possible due to, for example, timing restrictions on when species-specific surveys can be undertaken. In these cases, habitat features will not be studied in the EOS, but the proponent will commit to studying the feature prior to construction. Features will be treated as significant in an interim period until such time as the detailed study is carried out. During the EIS, they are assessed as significant features and mitigation measures are identified, as required. If, upon completion of detailed studies, they are found to be non-provincially significant, then the mitigation may not be enacted.

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For clarity, Table 19 in Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2012) documents which types of Candidate Significant Wildlife Habitat must undergo a formal Evaluation of Significance if found within 120 m of various components of the Project (marked with an “X”) or if found within 50 m of various Project components (marked with a “Y”). Other types of candidate habitat can be treated as significant, identified as “Generalized Candidate Significant Wildlife Habitat” and subject to general construction mitigation.

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2.0 Evaluation of Significance Results

Two features were identified through the Site Investigation that required further consideration as part of the Evaluation of Significance, including:

- Significant habitat for Threatened and Endangered species (woodland caribou); and,
- Candidate habitat for species of conservation concern (area sensitive species of birds).

The results of the evaluation of each of these features are presented in the following sections.

2.1 Significant Habitat for Threatened and Endangered Species

Habitat regulated under the *ESA, 2007* for woodland caribou encompasses a large swath of northern Ontario, including the entire region covering and surrounding the Project Location.

Habitat present at, and within 120 m of, the Project Location can be described as Category 3 woodland caribou habitat meaning that no significant features are present which support important lifecycle or seasonal needs. The area is more accurately described as providing indirect, supporting habitat which may be used incidentally from time to time.

This habitat, although less sensitive than Category 1 and 2 habitat, is regulated under the *ESA, 2007*.

This type of habitat is, therefore, considered to be known, provincially significant habitat and will be carried through to the EIS for further study and assessment.

2.2 Candidate Habitat for Species of Conservation Concern

Habitat which supports several avian Species of Conservation Concern, including the Eastern Wood-Pewee and Olive-sided Flycatcher, may be present at, and within 120 m of the Project Location. Bird surveys conducted as part of the Site Investigation were completed outside of the appropriate breeding period and, as such, the extent of use of the forest by rare bird species could not be determined. Because the candidate habitat is located within the Project Location itself, the habitat was initially treated as significant on an interim basis and a commitment was made to complete surveys to confirm significance prior to construction.

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In June 2014, additional field data collection for breeding birds was completed by Northern Bioscience Ecological Consulting, as documented in Appendix G. The study followed the generally accepted protocols as recommended in the Draft Natural Heritage Assessment (Neegan Burnside, 2013). The field survey generally followed approaches outlined in *Birds and Bird Habitats: Guidelines for Wind Power Projects* (OMNR 2011) and used methodology consistent with those used for the 2001 to 2005 Atlas of the Breeding Birds of Ontario (Cadman et al. 2007). A total of 17 point counts were conducted between 5:45 and 8:30 a.m. on June 9 and June 28, 2014. As in the Breeding Bird Atlas, point counts were of 5 minutes duration with all birds heard or seen at distances of <50 m, 50 to 100 m, and >100 m were recorded. During each visit, stations were located approximately 250 m apart to prevent double-counting of individual birds.

A total of 175 birds of 30 species were observed on or near the project site during the 2014 surveys. No Eastern Wood-Pewee, Olive-sided Flycatcher or other bird Species At Risk were observed during the 2014 surveys within the Project Location or adjacent lands. Complete results of these surveys are found in Appendix G.

Based on the 2014 studies summarized above and documented in Appendix G, there is no confirmed significant habitat for avian Species of Conservation Concern at or within 120 m of the Project Location. As such, this type of habitat will not be carried through to the EIS for further study and assessment.

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3.0 Summary of Significant Features

Based on the results of the EOS, features present at, or within 120 m of, the Project Location are summarized in **Table 12**.

Table 12 Significant Features

Feature Type	Level of Significance	Distance between Feature and Project Components	Carry Forward to EIS?
Habitat of Threatened and Endangered species	Significant	0 m Habitat overlaps with Project Location.	Y
Habitat for Species of Conservation Concern	Not Significant	N/A	N

Potential impacts to the Habitat of Threatened and Endangered species will be assessed in the EIS in Part IV of this report.

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**Natural Heritage Assessment
Part IV: Environmental Impact Study**

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1.0 Environmental Impact Study

1.1 Purpose of the EIS

The purpose of the EIS is to:

- Identify and address any potential negative environmental effects that the Project may cause to significant or provincially significant natural features within 120 m of the Project Location.

Specifically, the EIS must identify:

- potential negative effects resulting from the Project;
- mitigation measures to be used to minimize environmental effects;
- an Environmental Effects Monitoring Plan (“EEMP”), including:
 - performance objectives;
 - mitigation measures planned to achieve performance objectives;
 - monitoring to ensure that mitigation strategies are meeting objectives; and,
 - contingency plans, should mitigation measures fail to meet objectives.
- describe how the Construction Plan Report addresses any negative environmental effects.

Mitigation measures and the EEMP provided herein are consistent with information provided in the *Construction Plan Report* and *Design and Operations Report* (Neegan Burnside, 2013).

1.2 Environmental Impact Study and EEMP Framework

1.2.1 Potential Negative Environmental Effects

The EIS identifies all potential negative environmental effects on significant natural features as a result of the Project activities listed in **Table 13**.

A number of criteria for each potential negative environmental effect were considered to understand the extent of the effect and to develop appropriate mitigation strategies. Key considerations included:

- the magnitude of the effect both in intensity and spatial scale;
- the proximity of the effect in relation to the Project;
- the likelihood of occurrence and reoccurrence of the effect;
- the timing and duration of the effect;
- the permanence or irreversibility of the effect; and,

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- the potential effect on the size, diversity, health, connectivity, functionality and resilience of the natural feature.

1.2.2 Mitigation Strategies

The primary mitigation measure employed to reduce impacts to natural features and functions was avoidance. Siting of the Project was undertaken with consideration of potential impacts to natural features, wildlife and wildlife habitat. The Project is sited predominately on lands previously disturbed by an old logging camp and past timber harvesting activities.

Mitigation will be enacted through a variety of mechanisms, including:

- **Contract Documents:** Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation (Whitesand) as agent is committed to operating the Project in an environmentally responsible manner and in compliance with all applicable environmental laws, regulations, and guidelines. All of Whitesand's contractors and subcontractors will be accountable for actions that have an adverse effect on the environment. As such, any contract documents executed by Whitesand will incorporate appropriate provisions from the REA documents. These organizations will also comply with all relevant local, provincial, and federal legislation.
- **Management Structures:** Whitesand, the construction Contractor, and the Operation and Maintenance Contractor or staff, will take steps to ensure that they have appropriately skilled personnel to carry out the environmental responsibilities as defined in this Report. All organizations associated with Project development activities will develop responsive reporting systems that clearly assign responsibility and accountability for development actions. As appropriate, Whitesand will review these reporting documents.
- **Change Management:** During implementation of the Project, change may be required to address unforeseen or unexpected conditions or situations. Whitesand, the construction Contractor and the Operation and Maintenance Contractor or staff will be responsible for ensuring environmental and safety issues are addressed. Whitesand will incorporate any significant changes to Project programs, procedures, and plans throughout the life of the Project.
- **Environmental Procedures:** Whitesand, the construction Contractor and the Operation and Maintenance Contractor or staff will be responsible for implementing all approved environmental procedures during all phases of the Project. Individual personnel responsibilities will be assigned as necessary to support the full and

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effective implementation of the environmental procedures. Environmental procedures will address the following issues to prevent environmental contamination:

- **Spills and releases:** to identify the specific procedures for the prevention, response, and notification of spills. In addition it should establish the general procedures for spill clean-up, personnel training, and material handling and storage to prevent spills.
- **Hazardous waste management:** to outline the procedures for the proper identification of hazardous waste and its proper storage, handling, transport, and disposal. In addition, the procedures should outline specific requirements for personnel training, emergency response, product review and approval, and record keeping.
- **Solid waste management:** to establish alternative procedures for the management and disposal of used lubricants, used drums, and general office waste.

The procedures above will ensure internal and external risks are fully evaluated and the information communicated to personnel in advance of any accident or malfunction.

- **Operation and Maintenance Training Program:** As appropriate Whitesand and/or the Operation and Maintenance Contractor and/or staff should develop an operations training program to ensure personnel receive appropriate training in relation to operation and maintenance programs, environmental procedures, and the emergency preparedness and response plan. With respect to the environment and natural features, training may cover the following issues:

Environmental Protection, including:

- any inspection, monitoring, maintenance and reporting required by Project permits and/or applicable environmental legislation;
- important/sensitive environmental features and areas;
- incidence reporting (spills, wildlife incidents); and,
- materials disposal.

Facility Safety, including:

- security and safety protocols and responsibilities;
- accident reporting; and,
- chemical and hazardous materials handling.

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Emergency Preparedness, including:

- fire preparedness and response;
- natural disasters (i.e., extreme weather events); and,
- hazardous materials and spill response.

Training should begin as the initial staff complement is hired during the pre-operational mobilization period. There should also be on-going training for personnel as well as specific training sessions for new hires.

1.2.3 Performance Objectives

Performance objectives were developed to provide a benchmark against which to evaluate the success of mitigation strategies. In general, performance objectives are to:

- minimize environmental effects during all phases of the project;
- reduce or eliminate the environmental effects on natural habitats, flora, and fauna;
- avoid accidents and malfunctions;
- avoid levies or sanctions from the corresponding authorities for negligent environmental performance; and,
- comply with all environmental quality standards set by law.

Performance objectives specific to significant natural features and project activities are listed in **Table 14** of this report.

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2.0 Description of Project Components and Activities

Information about facility construction, operation, maintenance and decommissioning is provided in **Table 13**. Additional details can be found in the *Construction Plan Report*, *Design and Operations Report* and *Decommissioning Report* (Neegan Burnside, 2013).

Table 13 Project Activities by Phase

Phase	Project Activities
Construction	<p>Woodyard:</p> <ul style="list-style-type: none"> • survey for layout and delineation of work areas; • installation of erosion and sediment controls and site safety measures for construction; • delivery of construction and Project equipment to site; • site preparation, clearing and grubbing; • general earthworks (site grading); • excavation and installation of underground utilities; • construction of the maintenance garage, biomass belt dryer, waste oil building, including foundations, and containment sump for the waste oil building; • construction of the mechanical conveyor system, including foundations and enclosures for its associated equipment; • construction of the diesel fuel storage and filling station; • fine-grading and installation of site drainage features; • construction of gravel access roads, truck scale, and select areas of asphalt and/or concrete paving; • installation of final safety, security, and fire protection equipment, including entrance gates, and safety fencing as required around the substation and water storage pond; and, • restoration of all temporarily disturbed areas upon completion of Project construction.
	<p>Cogeneration Plant:</p> <ul style="list-style-type: none"> • excavation and installation of the utilities under the cogeneration plant with protected leads extending outside the building footprint; • construction of the cogeneration plant building, including cooling tower, baghouse/exhaust stack, ash collection/storage system, and foundations; • installation of equipment for use in cogeneration plant; • connection with the yard mechanical conveyor system; and, • installation of pad-mounted transformers, backup generator, and associated electrical equipment.

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Phase	Project Activities
	<p>Pellet Plant:</p> <ul style="list-style-type: none"> • excavation and installation of the utilities under the pellet plant with protected leads extending outside the building footprint; • construction of the Pellet Plant building and ancillary equipment, including foundations; • installation of equipment for use in pellet plant; • connection with the yard mechanical conveyor system; and, • installation of the pad-mounted transformer and associated electrical equipment. <p>Water Supply and Storage:</p> <ul style="list-style-type: none"> • connection of wells to on-site buildings and site fire protection equipment via an underground water distribution system; • installation of storage tanks in building(s) for fire protection demand (if feasible); and, • excavation and construction of a pond with liner for fire protection demand (if required). <p>Wastewater Management:</p> <ul style="list-style-type: none"> • install oil/grit separator for maintenance garage wash-up wastewater; • install gravity pipes and/or forcemains with pumps to connect on-site buildings to the underground effluent disposal bed; • excavate and place underground tankage; • excavate disposal bed area and install perforated pipe and stone for effluent distribution; and, • install and connect system controls and alarms as required. <p>Substation:</p> <ul style="list-style-type: none"> • excavate and install electrical grounding and granular foundation; • install electrical equipment at the substation; • install secondary containment system around the main transformer; and, • install safety, security, and communications equipment.

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Phase	Project Activities
Operation and Maintenance	<p>Woodyard:</p> <ul style="list-style-type: none"> • material transport via trucks to on-site weighing, sorting, storing, and shipping from site; • maintenance of gravel access roads, paved areas, vegetated areas, and site drainage features as required; • operation of mobile equipment, truck dumpers, and pile stackers for material sorting and storage; • material screening, processing, and transport via a mechanical conveyor system and ancillary equipment; • biomass drying via the on-site belt dryer; • filling, handling, and storage of waste oil barrels in the waste oil building, including periodic collection and disposal by a qualified service provider at an approved off-site facility; • periodic servicing (ie. pumping, removal, and cleanout as required) of the wastewater tanks and portable toilet by a qualified service provider; and, • mobile equipment maintenance and fuel filling at the maintenance garage and diesel fuel storage/filling station, including proper use, storage, and disposal of oils, lubricants, fuels and any other hazardous material.
	<p>Cogeneration Plant:</p> <ul style="list-style-type: none"> • treatment of supply water; • material transport via a mechanical conveyor system; • combustion of biomass; • creation of steam through use of a boiler; • electricity generation from a steam turbine and generator; • cooling and condensing re-usable process steam; • operation of a steam/glycol heating system; • drying of biomass; • operation of pumps, fans and exhaust venting; • monitoring of air emissions for compliance with regulated limits; • collection and storage of solid waste (ash) prior to transportation to an approved disposal facility; and, • operation of emergency backup generator during cogeneration plant maintenance or downtime.

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Phase	Project Activities
	<p>Pellet Plant:</p> <ul style="list-style-type: none"> • material transport and storage via a mechanical conveyor system and ancillary equipment; • pulverizing biomass through the use of a hammer mill; • creating wood pellets using process steam and a pellet mill; and, • packaging wood pellets for shipping. <p>Water Supply and Storage:</p> <ul style="list-style-type: none"> • water pumping in accordance with REA approval (greater than 50,000 L/day); • water quality testing as required; and, • well and pump testing and maintenance as required. <p>Wastewater Management:</p> <ul style="list-style-type: none"> • monitor system controls and alarms as required; and, • remove accumulated sludge and scum from tanks as required. <p>Transformer Substation:</p> <ul style="list-style-type: none"> • operation and monitoring of electrical equipment; • electrical equipment maintenance and transformer oil replacement; and, • automatic process shut down when facility is operating outside its specified parameters.
Decommissioning	<p>Woodyard:</p> <ul style="list-style-type: none"> • dismantling of the mechanical conveyor system and ancillary equipment, biomass belt dryer, truck scale, truck dumpers, security equipment, fencing, gates, and signs; • sale of above materials for salvage value or otherwise removal and recycle or disposal at an approved off-site facility; • removal and disposal at an approved facility of the diesel fuel storage and filling station in accordance with the applicable laws regarding fuel transport; • removal and disposal at an approved facility of the paved concrete and asphalt areas under the biomass storage pads and around the buildings; • removal of the gravel site roads if required in consultation with MNR; and, • restoration of affected land to its original state as required.

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Phase	Project Activities
	<p>Site Buildings:</p> <ul style="list-style-type: none"> • dismantling and sorting of all equipment within and associated with the cogeneration plant, pellet plant, maintenance garage, fire pump building, and conveyor equipment enclosures; • sale of above materials for salvage value or otherwise removal and disposal at an approved off-site facility; • removal of metal waste oil barrels by an approved hauler for disposal and recycling; • upon removal of all interior equipment and clean-up of any waste, demolish site buildings in accordance with applicable laws; and, • removal and recycle or disposal of the demolished building debris at an approved facility. <p>Water Supply and Storage:</p> <ul style="list-style-type: none"> • removal of the pond liner and filling-in the pond or leaving in-place as required by MNR; and, • decommissioning of wells in accordance with O.Reg. 903. <p>Wastewater Management:</p> <ul style="list-style-type: none"> • pumping-out any remaining waste from the wastewater tanks and oil/grit separator on-site and removal off-site at an approved facility by a licensed hauler; • removal of pump stations and sale for salvage value or disposal off-site at an approved facility; • filling of the underground tanks with suitable fill material, or demolition in-place in accordance with applicable regulations and in consultation with MNR; and, • upon completion of pumping, demolition, and filling in accordance with applicable regulations and guidelines; abandonment of wastewater management system and conveyance pipes in-place, in consultation with MNR.

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Phase	Project Activities
	<p>Transformer Substation:</p> <ul style="list-style-type: none"> • after disconnection, all the oil in the transformers will be safely removed by pumping the oil into an industry approved disposal container by an approved hauler to an approved waste management facility. The container will be sealed to prevent spills during transportation. The empty transformers will be removed and transported off-site by truck. The transformers will be recycled, if possible, or will be disposed of at an approved facility; • dismantling and sorting of all equipment at the transformer substation; • removal of underground infrastructure (i.e., power and grounding cables); • sale of above materials for salvage value or otherwise removal and disposal at an approved off-site facility; • removal of material within the main transformer's secondary containment area off-site at an approved facility, and replacement with a suitable fill material in consultation with MNR; and, • removal of surface gravel if required in consultation with MNR.

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3.0 Identification of Potential Negative Environmental Effects and Mitigation Measures

The following significant feature is present on, or within 120 m of, the Project Location:

- significant habitat for threatened or endangered species.

Potential impacts to this feature and mitigation to minimize impacts are described below and summarized in **Table 14**.

3.1 Significant Habitat for Threatened and Endangered Species

As described in the Site Investigation and EOS, Category 3 habitat is present for woodland caribou. This habitat does not include any significant features for the species and no recent sightings of caribou were noted by local residents during the Site Investigation (pers. comm., August 20, 2013). During the June 2014 surveys completed by Northern Bioscience Ecological Consulting to evaluate the habitat potential of the Project Location for area-sensitive species of breeding birds, the following summary was provided for potential woodland caribou habitat in the vicinity of the Project Location:

*Pellets of woodland caribou (*Rangifer tarandus*) were observed at 354757E 5571666N (NAD83, Zone UTM Zone 16) along a former forest access road approximately 270 m east of the project sties. As discussed in the draft Natural Heritage Report (Neegan Burnside 2013a), this area is considered Category 3 woodland caribou habitat, which is the least sensitive to development. This area is dominated by regenerating jack pine and trembling aspen forest, that supports alternate prey (i.e., moose) and predators such as black bear and gray wolf. In addition, its close proximity (<2 km) to the community of Armstrong and heavily disturbed condition (e.g., numerous linear disturbances) suggest that is not critical habitat for woodland caribou, and that negative effects on woodland caribou habitat can likely be addressed through appropriate mitigation.*

The full report by Northern Bioscience Ecological Consulting can be found in Appendix G.

The Project is located in the vicinity of the existing diesel generation station, an active MTO works yard, railway and an active gravel pit. As such, the site experiences disturbances due to noise and human presence. The Project will contribute additional noise sources to the area. Noise will be minimized to the extent possible by site plan design and equipment selection, and the facility will be designed to meet all provincial noise limits as required by O.Reg. 359/09 and the Environmental Compliance Approval (ECA) process.

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The Project Location is approximately 35 ha in size. It is expected that up to the entire site as required will be cleared for direct use by the facility structures, roads, biomass storage areas and other ancillary facilities. Currently about 5.8 ha have been cleared in association with the former logging camp. The remaining areas consist of second generation jack pine plantation and mature pine-spruce mixed wood forest. Both of these forest assemblages are very common on the landscape in the area.

As such, impacts to woodland caribou are expected to be negligible. No specific mitigation measures are required. However, as the habitat is regulated under the general habitat provisions of the *ESA, 2007*, the MNR will be consulted prior to construction regarding any permitting requirements.

3.2 Candidate Habitat for Species of Conservation Concern (Initially Treated as Significant)

Based on the results of the Neegan Burnside field data collection conducted during 2013, it was concluded that Species of Conservation Concern, including Olive-sided Flycatcher and Eastern Wood-Pewee had the potential to be breeding on, and within 120 m of the Project Location. However, due to the timing of the field studies conducted, the presence of breeding habitat for these species could not be concluded. Because the candidate habitat was located within the Project Location itself, the habitat was initially treated as significant on an interim basis and a commitment was made to complete surveys to confirm significance prior to construction.

Based on subsequent studies in June 2014, as summarized in the EOS and documented in Appendix G, there is no confirmed significant habitat for Species of Conservation Concern at or within 120 m of the Project Location.

While there is no confirmed significant habitat for Species of Conservation Concern at or within 120m of the Project Location, the Draft Natural Heritage Assessment (Neegan Burnside, 2013) made commitments to best practice mitigation strategies that would be implemented regardless of the presence of significant habitat for avian Species of Conservation Concern.

As noted in Section 3.1 above, it is expected that up to the entire 35 ha site will be cleared as required for construction. Habitat for breeding birds in this area will be lost for the duration of the facility operation.

Bird species may also be disturbed by noise and dust during construction and operations. As previously described, background noise is currently present due to the

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adjacent diesel generation station, MTO works yard and gravel pit. Noise levels are likely to increase but will remain within permitted thresholds set by the MOECC.

The following mitigation measures are recommended as best practices for the protection of migratory bird species, and are further summarized in **Table 14**:

- Any vegetation clearing should occur outside of the breeding bird season (May 16 to August 8) to avoid disturbance to breeding migratory species of birds.
- If vegetation clearing must occur during this period due to unforeseen circumstances, the area should be surveyed (pre-construction nest survey) by a qualified avian ecologist no more than two days prior to clearing. Appropriate buffers will be applied to confirmed active nests until they are no longer active. If there is confirmed evidence of nesting for species of concern, clearing should be avoided. If clearing cannot be avoided, the MNR will be contacted for advice regarding any potential mitigation options. No work within the affected habitat will occur without MNR approval.
- General mitigation measures will be used to ensure that clearing, grading, material storage and other construction activities do not encroach beyond the Project Location. These are described in detail in the *Construction Plan Report* and include:
 - the installation of sediment and erosion control fencing to limit the movement of sediment beyond the Project Location; and,
 - the boundaries of the Project Location will be surveyed and clearly marked.
- General mitigation measures will be used to minimize noise during construction and operations to minimize noise disturbance, as described in the *Construction Plan Report* and *Design and Operations Report*. Noise levels will be maintained within the limits specified in the REA and ECA approvals.

Environmental effects monitoring for Species of Conservation Concern during Project operation is not recommended as no records of confirmed breeding habitat use by Species of Conservation Concern were documented during the 2014 field data collection.

Table 14 Potential Effects, Mitigation

Potential Impacts and Mitigation					Environmental Effects Monitoring Plan					
Project Activity	Potential Effects (D=Direct) (I=Indirect) Potential effect on the size, diversity, health, connectivity, functionality and resilience of the natural feature.	Mitigation Strategy	Residual Effect (magnitude/frequency/duration)	Performance Objective	Methodology	Monitoring Locations	Frequency and Duration of Sample Collection	Technical and Statistical Value of Date	Reporting Requirements	Monitoring Plan and Contingency Measures
Habitat of Threatened and Endangered Species: Category 3 Woodland Caribou Habitat										
All Construction, Operation and Decommissioning Activities	<ul style="list-style-type: none"> Loss of approximately 35 ha of Category 3 habitat (D) 	<ul style="list-style-type: none"> Minimize the footprint of the facility and land clearing requirements to the extent possible. Minimize construction effects (noise, dust, erosion/sedimentation) Review potential impacts with the MNR to confirm permitting requirements and additional mitigation, if required under the ESA, 2007. 	<ul style="list-style-type: none"> Limited geographic extent based on entire range of Category 3 habitat. Low magnitude based on relatively low importance of Category 3 habitat. Duration of effect will last for the entire life of the facility. No residual effect to the species anticipated. 	<ul style="list-style-type: none"> Minimize loss of Category 3 habitat to the extent possible. 	<ul style="list-style-type: none"> No Environmental Effect Monitoring needed unless specified as part of ESA, 2007 requirements. 					
Habitat for Migratory Breeding Birds										
Tree and vegetation clearing for construction	<ul style="list-style-type: none"> Loss of approximately 35 ha of breeding habitat (D). Potential for greater loss if clearing, encroachment of equipment or stockpiles inadvertently 	<ul style="list-style-type: none"> Tree and vegetation clearing will not occur during the breeding bird season (May 16 to August 8). The site boundaries will be surveyed and marked to limit encroachment within Project Location. No clearing, grading, stockpiling of 	<ul style="list-style-type: none"> Loss will be experienced for the life of the project; however, magnitude considered to be low based on large extent of suitable habitat present in the surrounding area. 	<ul style="list-style-type: none"> Minimize habitat loss to the extent possible and limit direct loss to the confines of the Project Location. 	N/A	N/A	N/A	N/A	N/A	N/A

	extends beyond the Project Location boundary (D).	<p>materials, temporary work areas, etc. will be permitted beyond the Project Location.</p> <ul style="list-style-type: none"> • During construction, an Environmental Inspector will regularly monitor operations to ensure that activities do not extend beyond the Project Location. • If accidental encroachment occurs the offending material or equipment will be immediately removed and restoration of the area conducted as needed. 								
Land clearing, construction and decommissioning activities	<ul style="list-style-type: none"> • Movement of exposed sediment into the features (I). • Sedimentation could have a minor effect on the size of woodland and on its function (I). 	<ul style="list-style-type: none"> • Silt fencing will be installed to limit soil movement beyond the boundaries of the Project Location. • Erosion and sediment control measures will be regularly inspected to ensure they are functioning and are maintained as required. • If erosion and sediment control measures are not functioning properly, alternative measures will be implemented and prioritized above other construction activities. 	<ul style="list-style-type: none"> • Limited duration, frequency, geographic extent. • No residual effect anticipated. 	<ul style="list-style-type: none"> • No vegetation loss or disturbance associated with sediment and erosion beyond the Project Location. 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A

<p>Construction activities and Facility Operations</p>	<ul style="list-style-type: none"> Noise disturbance during construction and operations could cause bird species to avoid suitable nesting areas adjacent to the project (I). No effect anticipated at the species level. 	<ul style="list-style-type: none"> Noise levels will be maintained at or below the approved limits set out by MOECC in the REA and ECA approvals. 	<ul style="list-style-type: none"> Loss will be experienced for the life of the project; however, magnitude considered to be low based on large extent of suitable habitat present in the surrounding area. 	<ul style="list-style-type: none"> Minimize disturbance effects to maintain breeding habitat in the area. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
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4.0 Habitat Use Studies

Habitat use studies to confirm the significance of habitat for species of conservation concern were completed in 2014, as documented in Appendix G. The studies were completed in accordance with the methodology outlined in the Draft Natural Heritage Assessment (Neegan Burnside, 2013), which is summarized in **Table 15** for reference. As a result of the studies provided in Appendix G, it was confirmed that breeding habitat for bird species of conservation concern was not present at or within 120 m of the Project Location.

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Table 15 Pre-Construction Survey Methodology

Survey Type	Purpose	Summary of Methods	Date(s), Time(s) (Duration)	Weather Conditions	Qualification of Surveyor
Breeding Bird Survey	<p>To confirm the relative use of habitat at, and within 120 m of, the Project Location by avian species of conservation concern.</p> <p>To confirm the significance of habitat for species of conservation concern.</p>	<p>Wandering transects through the Project Location and its 120 m vicinity.</p> <p>Survey will be consistent with the methodology for “Area Searches” as described in <i>Birds and Bird Habitats: Guidelines for Wind Power Projects</i> (MNR, 2011, pg. 15)</p>	<p>Dates: Two surveys between June 1 and July 10 with at least ten days between each survey.</p> <p>Time of Day and Duration: Between dawn and five hours after dawn.</p>	<p>Surveys should <u>not</u> be done if:</p> <ul style="list-style-type: none"> • It is raining; • There is thick fog; • Winds are greater than 19 km/hr. (>3 on the Beaufort scale). 	<p>An avian/terrestrial ecologist with experience in the identification of birds by sight and call.</p>

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5.0 Conclusions

The Whitesand First Nation Cogeneration and Pellet Mill Project is located on lands which have been previously disturbed as a result of past logging activities and a former logging camp. The only significant feature on, and within 120 m of, the Project Location is habitat of Threatened and Endangered species: Category 3 woodland caribou habitat.

Avian Species of Conservation Concern were encountered during the Site Investigation in August 2013, outside of the applicable breeding bird period. Based on subsequent studies during the applicable breeding bird period in 2014, it was concluded that there is no significant habitat for avian Species of Conservation Concern on or within 120 m of the Project Location.


Mitigation measures and performance objectives have been set with the goal of limiting the extent of impacts to Category 3 woodland caribou habitat. While it was concluded that there is no significant habitat for avian Species of Conservation Concern on, or within 120 m of the Project location, mitigation measures and performance objectives were established as best practices with the goal of avoiding or limiting the extent of impacts to migratory breeding birds. With the mitigation measures described in this report, it is anticipated that performance objectives can be met.

Respectfully submitted,

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