

**Environmental Protection Plan
Big Triangle Pond Mineral Exploration Resource Access Road and
Associated Mineral Exploration Activities**

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October 2015

Note: Where a provision, statement or any correspondence made under this EPP is inconsistent or conflicts with a provision, term or condition of provincial or federal legislation, policy or guidelines, the provision, term or condition of provincial or federal legislation, policy or guidelines shall have precedence over the provision, statement or any correspondence made under this EPP.

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Abbreviations and Acronyms

ATV – All-Terrain Vehicle
BFL – Boreal Felt Lichen
COSEWIC – Committee on the Status of Endangered Wildlife in Canada
DFO – Department of Fisheries and Oceans
EEMP – Environmental Effects Monitoring Plan
EPP – Environmental Protection Plan
HSE – Health Safety and Environment
IOC – Iron Ore Company of Canada
IP – Induced Polarization
MBMR – Manitoba Mineral Resources
MSDS – Material Safety Data Sheet
NLDOEC – Newfoundland and Labrador Department of Environment and Conservation
NLDNR – Newfoundland and Labrador Department of Natural Resources
NLDTW – Newfoundland and Labrador Department of Transportation and Works
NLESA – Newfoundland and Labrador Endangered Species Act
NSE – Nova Scotia Environment
RC – Reverse Circular Drilling
SARA – Species at Risk Act
SME – Saskatchewan Ministry of Environment
SMEGAC – Saskatchewan Mineral Exploration and Government Advisory Committee
VBNC – Voisey’s Bay Nickel Company
VEL – Vole Ear’s Lichen
WHMIS – Workplace Hazardous Materials Information System

In addition to the above noted abbreviations and acronyms, an additional list of applicable terminology is provided in Appendix D.

Section 1.0 Introduction

This EPP was originally authored by Ms. Lesley Sullivan, B.Sc., M.E.S., November 17, 2014 under contract to Eagleridge International Limited (Eagleridge), and the EPP was then peer reviewed with revisions that were completed by GHD Limited (GHD).

Eagleridge is planning to construct an 11 km resource access road for safe, secure, reliable, and efficient daily access to conduct a mineral exploration project in the Big Triangle Pond area (the Project Site). The road has been carefully planned in terms of route and design to take into account the Environmental Assessment (EA) Conditions and principles of good construction typical of that in Newfoundland and Labrador. A map showing the geographic location of the Site is presented in Figure 1.1.

An Environmental Protection Plan (EPP) is an integral piece and supporting document of any development plan seeking commencement in the province of Newfoundland and Labrador. EPPs are in place to ensure that construction, exploration and geotechnical activities are executed in a proper way to lessen any potentially negative environmental impacts on the surrounding environment. An EPP is a field ready practical document utilized for development projects that is dynamic and is improved and refined as the project develops.

At each stage of construction and development, potential environmental concerns and subsequent best environmental protection procedures are outlined to ensure appropriate protocols are followed at every subsequent step. Once environmental protection plans are written and in place legislatively, project personnel will also follow appropriate Environmental Effects Monitoring Plans (EEMPs), to assess and evaluate the status of any particularly sensitive issues a project will have, especially regarding any rare or at-risk species known in the area. This particular EPP also addresses specific guidelines to prevent and minimize potentially negative impacts on Valued Ecosystem Components (VECs) for both the construction and decommissioning/rehabilitation phase.

1.1 Purpose and Scope of Environmental Protection Plan

The undertakings relevant to the resource road construction and mineral exploration are activities that occur regularly in Newfoundland and Labrador, and a number of excellent guidance documents and legislation are referred to and used on a regular basis by exploration companies to guide them through these processes. Eagleridge is aware of these tools which are referenced throughout the document and listed in Section 5.

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Figure 1.1 Geographic Location of the Big Triangle Pond Property



Geographic location of the Triangle Pond property

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The purpose of this document is to supplement the above noted guidelines and legislation and outline potential environmental concerns and protection measures associated with the Project resource access road construction and associated exploration activities. This is followed by appropriate and proven best management practices to help mitigate any concerns that are identified. This document strives to implement restoration and mitigation for all construction and road decommissioning activities as determined by the provincial EA Process, a requirement of all regulatory agencies through the permitting process.

This EPP also aims to encompass the following:

- i) Compliance with all requirements of relevant federal and provincial legislation;
- ii) All Conditions which were previously identified by the EA release relevant to the road and exploration;
- iii) All environmental commitments outlined as part of the EA, and;
- iv) All relevant and applicable environmental protection measures as highlighted by the EA.

1.2 Objectives of EPP

The Environmental Protection Plan for the proposed Big Triangle Pond Mineral Exploration resource access road has the following objectives:

- i) To assess, identify and evaluate any potential negative environmental effects associated with the construction of the road and exploration activities;
- ii) To implement applicable rehabilitation and mitigation techniques to lessen or avoid these potential negative impacts;
- iii) To meet and satisfy all regulatory requirements of both federal and provincial legislation; and
- iv) In the event of accidental events, provide appropriate direction through the development of descriptive contingency plans.

1.3 Organization of EPP

This Environmental Protection Plan includes the following sections:

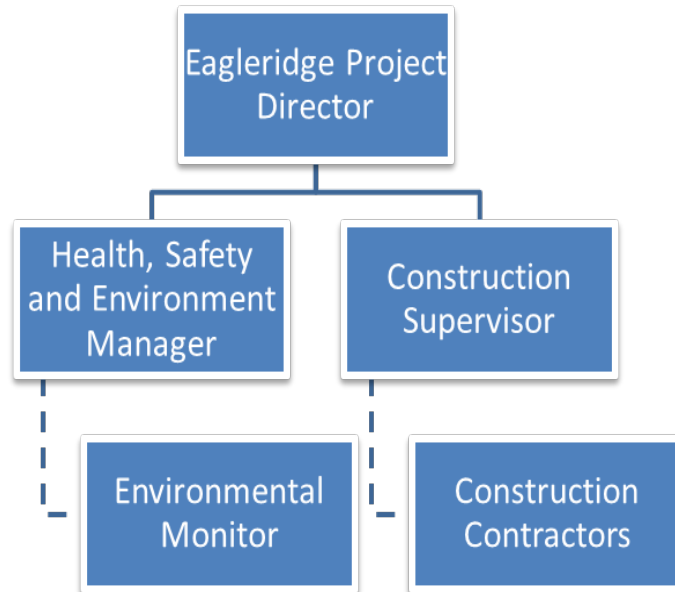
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- i) Section 1 introduces the EPP. It highlights the overall purpose of EPPs, the particular scope of the document for this project, concrete objectives as well as the roles and responsibilities of all parties involved. It also provides a detailed description of the Project and planned construction and exploration activities;
- ii) Section 2 outlines all the potential environmental concerns of the Project, followed by detailed environmental protection procedures;
- iii) Section 3 describes all the potential response actions for unplanned or accidental outcomes, referred to in the industry as contingency plans;
- iv) Section 4 highlights sensitive aspects of the Project which will require continued attention and monitoring throughout the undertaking, known as EEMPs. This section discusses avifauna, aquatic species, woodland caribou, sensitive lichen species and societal concerns in the area;
- v) Section 5 reviews applicable legislation to be adhered to on a federal, provincial and municipal level; and
- vi) Section 6 outlines all environmental guidelines to be followed when the proposed resource access road is decommissioned and rehabilitated.

1.4 Roles and Responsibilities

This section outlines the parties involved in the on-site activities of the project and their roles, responsibilities. An organizational chart depicting the hierarchy of personnel is presented in Figure 1.2 below.

Figure 1.2 On-Site Organizational Chart



1.4.1 Eagleridge International Limited Project Director

The Eagleridge Project Director's role is to provide overall leadership and support of the EPP and EEMPs to be applied during the resource access road construction and exploration activities. The Project Director's specific responsibilities are as follows:

- i) Assigning resources and responsibilities for the implementation, distribution, and improvement of the Project's environmental management system including the requirements of this EPP;
- ii) Providing final approval for the EPP document;
- iii) Inspecting and monitoring all work being facilitated;
- iv) As required, liaising with government agencies and related community interest groups;
- v) Understanding and applying general legislative environmental requirements;
- vi) Consulting on and resolving environmental issues including, leading incident investigations, etc.; and
- vii) The primary contact for all regulatory agencies and communications relative to the Project, unless delegated to the HSE Manager.

1.4.2 **Eagleridge Health, Safety and Environment Manager**

The Eagleridge Health, Safety and Environment (HSE) Manager reports directly to the Eagleridge Project Director and liaises with the Construction Supervisor. The HSE Manager manages the Environmental Monitor (EM) and has the overall responsibility for championing the EPP and associated EEMPs. The HSE Manager's specific environmental responsibilities are as follows:

- i) Ensuring the EPP is followed by all employees on site at all times and that the document is updated and revised as required;
- ii) Reviewing the EPP and EEMPs and all related documentation with contractors, subcontractors and site personnel. The HSE Manager will hold an initial pre-construction formal EPP review meeting with the Construction Supervisor and main Construction Contractors. Subsequent EPP review meetings will be held as needed to communicate/train subcontractors and site personnel;
- iii) Implementing all commitments outlined in the EPP;
- iv) Confirming that all contractors, subcontractors and site personnel comply with all aspects of the EPP, including applicable laws and regulations as well as the requirements of the contract;
- v) Obtaining and ensuring that all proper approvals, authorizations and permits pertinent to conduct the work are in place;
- vi) Liaising with appropriate regulatory agencies such as the Newfoundland and Labrador Department of Environment and Conservation's (NLDOEC) Wildlife and Water Resources Management Divisions regarding reporting, coordination of site visits, transfer of appropriate information and compliance with all relevant legislation, permits, approvals and authorizations;
- i) Periodically reviewing and revising the EPP to keep it up to date and relevant, ensuring any necessary changes are initiated to improve the quality, and that any and all revisions are entered onto the Revision Log Form located in Appendix A;
- vii) Facilitating on-site inspections of installed environmental protection structures and ensuring buffer widths are maintained (as described in Section 2.5);
- viii) Responding to reports of wildlife on-site and in turn determining mitigation actions;
- ix) Responding accordingly to, and following contingency plans for (as outlined in Section 3.0): dangerous wildlife encounters, forest fire and extreme weather

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- events, the discovery of historic resources, and the hazardous waste, fuel and material spills.
- x) Noting changes to existing environmental protection structures and communicating these to the Construction Supervisor;
 - xi) Contacting and appropriately advising the Construction Supervisor when any contractors are not complying with guidelines outlined in the EPP or EEMPs, or it is determined through monitoring and reporting that environmental regulations are not being met; and
 - xii) Overseeing that new personnel are fully aware of all environmental protection procedures and guidelines outlined, and are given an appropriate environmental orientation and training.

1.4.3 **Eagleridge Environmental Monitor (EM)**

The Eagleridge EM reports directly to the HSE Manager. The EM monitors day to day environmental mitigation activities and impacts. Specific responsibilities of the EM are as follows:

- i) Collecting and reporting on required environmental monitoring data;
- ii) Maintaining sampling equipment (calibrating, maintenance, etc.);
- iii) As necessary, sending samples off-site for proper analyses;
- iv) Writing reports detailing the status of installed environmental protection structures, with photographic records;
- v) As necessary, responding in an appropriate manner to resolve any issues associated with water quality;
- vi) Aiding the HSE Manager with duties such as: environmental reporting and monitoring, providing site personnel with environmental training materials and providing orientation of site personnel with regard to contractor environmental training; and
- vii) Monitoring any and all wildlife sightings and all relevant field monitoring activities.

1.4.4 **Construction Supervisor**

The Construction Supervisor reports directly to the Eagleridge Project Director and liaises with the Eagleridge HSE Manager. The Construction Supervisor's role is to provide

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leadership and ensure the application of required environmental management processes for the construction of the resource access road. The Construction Supervisor manages the Construction Contractors and sub-contractors on-site. Specific responsibilities of the Construction Supervisor are as follows:

- i) Collaborating with the HSE Manager and the EM to ensure the implementation of environmental protection through following guidelines set out in the EPP and EEMPs;
- ii) Notifying the appropriate authorities in the case of emergency or incident situations;
- iii) Reporting any environmentally sensitive issues reported by the Construction Contractor to the HSE Manager;
- iv) Reviewing and overseeing all inspection reports and mitigation actions;
- v) Issuing stop work orders; and
- vi) Responding to all non-compliance situations or incidents and ensure appropriate action.

1.4.5 Construction Contractor

Construction Contractors report directly to the Construction Supervisor and liaise with the EM. Construction Contractors are responsible for completing the overall construction of the resource access road and associated infrastructure within the scope of their contract packages in full compliance with all Project requirements, and within all laws and regulations. Specific on-site duties include:

- i) Implementing and following all environmental protection measures that are outlined in the EPP along with complying with all regulations, legislation, permits, authorizations and approvals;
- ii) Responsible for maintaining records of accidents, incidents, alterations, equipment maintenance, wastes and public complaints, and communicating these directly to the Construction Supervisor;
- iii) Reporting discoveries of heritage resources, human remains, paleontological artifacts or environmentally sensitive sites to the Construction Supervisor;
- iv) Implementing contingency response plans as needed and identification of hazardous materials; and

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- v) Identifying contaminated sites and appropriate remediation and reporting them to the Construction Supervisor.

1.4.6 Subcontractors and Other Site Personnel

All subcontractors and site personnel listed have the following responsibilities:

- i) Have read and have a working knowledge of all procedures outlined in the EPP, including any revisions; and
- ii) Facilitate any and all restoration, reclamation or general clean-up procedures as directed by applicable government agencies and Eagleridge.

1.5 Project Description

The purpose of the proposed resource access road is to facilitate mineral exploration work on the Avalon Peninsula in the vicinity of Big Triangle Pond, Southern Peak Pond and Conns Pond, within the municipal limits of the town of Holyrood. The geographical location of the Site is presented in Figure 1.1. The proposed resource access road location is presented in Figure 1.3 and in large foldout format in Appendix B. Toward the north of this proposed resource access road is Highway 1 (Trans-Canada Highway (TCH)) and to the west is Highway 90 (Salmonier Line). Toward the south is the Salmonier Nature Park and to the southeast is the Avalon Wilderness Reserve. To provide an adequate buffer, the road will not be constructed within 800 m of the Salmonier Nature Park and a minimum of approximately 3 km away from the Avalon Wilderness Reserve Area.

The proposed class C-2 resource access road extends a total of 11 km through the center of the Project Site, with the majority of exploration activity occurring no more than 1 km to the east and 1 km to the west of the access road. To avoid wetlands, the proposed resource access road will be constructed in dry areas, running down the center of the 11 km strike-length of the targeted geology in the exploration Project Site. Construction of this proposed resource access road will be in compliance with the Newfoundland and Labrador Department of Natural Resources' (NLDNR's) Resource Road Construction Environmental Guidelines and Design Criteria (1985) and specified environmental standards such as Environmental Protection Guidelines for Ecologically Based Forest Resource Management (1998) and Newfoundland and Labrador Department of Transportation and Works' (NLDTW's) Highway Design Division Specifications Book (2011). A typical cross section of the proposed road is presented in Appendix B.

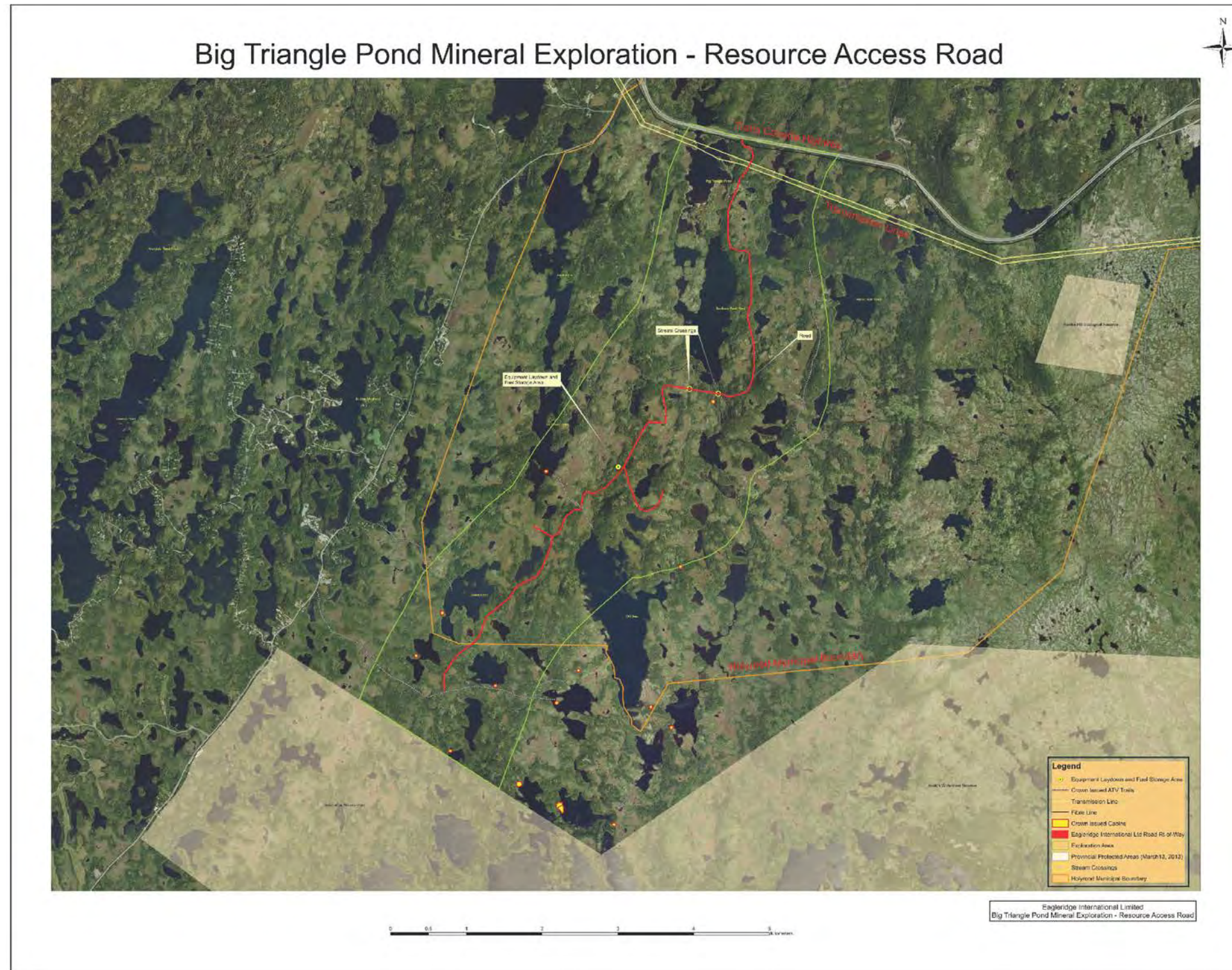
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In reference to the attached Mineral Licenses map shown in Appendix C, the proposed exploration activities will be facilitated within the boundaries of the following Mineral Licenses: 023007M and 017545M. The general areas where these mineral licenses are located encompass forested land consisting of low volume stands, ponds, streams and wetlands.

1.5.1 Scheduled Construction Activities

Construction of the proposed resource access road will begin once the Minister of NLDOEC and all other regulatory bodies approve and release this EPP document and a Crown Lands license to occupy (LTO) has been issued. Mineral exploration activities will follow the exploration approval process through the NLDNR. Construction of the road is estimated to have a duration of approximately 3-4 months. Mineral exploration activities will be facilitated in phases spanning a time period of approximately 6 years but is not limited to this time frame.

Figure 1.3 Big Triangle Pond Mineral Exploration Resource Access Road Location



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The proposed 11 km long resource access road includes 2 small spur roads and will be constructed following class C-2 road guidelines that are set out by the NLDNR. As per these guidelines, the right-of-way (ROW) clearing will be 20 m in width while the surface of the road will be 6 m wide. Road construction will be facilitated by use of an excavator using applicable techniques that minimize any potential environmental impacts and will be located a minimum of 20 m away from any water bodies.

To ensure natural drainage of the area, 1 arch culvert and 1 bridge will be constructed along the proposed resource access road. Geographic Information System (GIS) data for the road and crossing structures (bridge and culvert) will be provided to the Crown Lands Division of the Newfoundland and Labrador Department of Municipal and Intergovernmental Affairs (NLDMIGA), with a copy to the EA Committee. Bridge and culvert location GIS data will also be supplied to the Water Resources Management Division of the NLDOEC, as it will be a permit Condition. Grubbed material and organic matter that was retained in piles (windrows) at the extremities of the cleared ROW following construction will be used for road decommissioning and rehabilitation.

The specific mineral exploration activities intended for this project include: line cutting, soil sampling, ground geophysics, trenching and diamond drilling. Line cutting will be facilitated using a grid formation with lines that are no more than 1 m wide. Drill trails will be kept to a maximum of 4 m wide to reduce potential disturbance and will take advantage of open, dry areas, thereby reducing the need for tree cutting. Any trenching activity and disturbed lands will be properly and effectively remediated upon completion of each activity.

Specifically, planned exploration activities include the following:

- i) Line cutting, approximately 140 km remaining (35 km completed in 2012);
- ii) Soil sampling, approximately 10,000 samples remaining (900 soil samples in 2012). Sample sizes range from a 100 to a 250 grams sample size;
- iii) Shallow Induced Polarization (IP) ground geophysics, approximately 120 km remaining (30.5 km completed in 2013);
- iv) Deep IP ground geophysics required, approximately 100 km;
- v) Trenching along the side of the proposed resource access road to test and map the geology;
- vi) Extensive prospecting of exposed bedrock and boulders. Samples approximately fist sized or slightly larger;

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- vii) Consulting with experts from around the world to help understand the geology and mineralization to pinpoint target areas through collaborative efforts to maximize the effectiveness of the exploration budget;
- viii) Reverse Circular (RC) drill program to test and map mineralization. A depiction of potential locations are shown on the proposed RC drill hole locations map presented in Appendix B;
- ix) Core drilling program to locate mineralization in bedrock. Numbers and locations of drill holes will be determined based on current and potential future data collected and analyzed by Eagleridge and industry professionals;
- x) RC drill and bedrock drill results will be evaluated through collaborating with experts from different parts of the world. Through these combined efforts, the potential of the Big Triangle Pond property will be determined;
- xi) Eagleridge currently estimates that its mineral exploration project will have a duration time of approximately 6 years but is not subject to or limited to this time period; and
- xii) All permits related to mineral exploration activities will be obtained from the Mineral Lands Division of NLDNR, (respecting which relevant applications will be vetted through the NLDOEC and the Town Council of Holyrood and any other relevant governmental departments).

1.5.2 Stream Spatial Analysis

Eagleridge's proposed resource access road has a 20 m road ROW clearing. The proposed route has two streams that are identified on a 1:50,000 topographic maps. Eagleridge has also purchased a spatially accurate Vector Hydrology database created from aerial imagery flown in 2009, from the NLDMIGA - Surveys and Mapping Division. This database is generally considered to be accurate to approximately 2 m horizontally.

Along with this Vector Hydrology database and the proposed access road route, a geospatial analysis using ArcGis, Geographical Information System (GIS) software, was conducted to determine the coordinates of all streams that intersected the proposed 20 m ROW. The results of this geospatial analysis revealed there were four streams, including the two identified on 1:50,000 topographic maps. The location of these streams is presented on the Streams Identified Using Geospatial Analysis figure in Appendix B.

As noted in several sections below, the *Environmental Control Water and Sewage Regulations, 2003*, as well as Construction Contractors' industry standard "Standard

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Operating Procedures” (SOPs) will be strictly adhered to in regards to potential siltation of water bodies, and particularly at the locations noted on the figure referred to above in Appendix B.

Section 2.0 Potential Environmental Impacts and Environmental Protection Procedures

Environmental protection procedures described below will be incorporated into the construction and exploration phases of the Project. Measures for mitigation will be in accordance with all applicable provincial and federal standards, codes, acts and regulations and guidelines.

2.1 Surveying

2.1.1 Potential Environmental Concerns

The potential negative impacts of surveying include the disturbance of historic resources, wildlife species or important vegetation. Typical surveying encompasses traversing, limited vegetation clearing for survey sightlines and establishing permanent benchmarks (small aluminum or steel posts at or near ground surface).

2.1.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts of surveying include the following:

- i) Trees will be left standing if they are not directly located on transit lines. Instead of complete removal, trees located partly on the line will be notched;
- ii) Reduce the width of survey lines to whatever is necessary for unobstructed passage and line of sight;
- iii) Wherever possible, shrubs and trees shall be cut so that they are flush with the ground. Stumps shall not exceed 15 cm;
- iv) Keep the cutting of survey lines to a minimum and utilize alternative areas which do not require cut lines where possible;
- v) Avoid, whenever possible, cutting lines to the boundary between open and treed areas;
- vi) If available, ensure that any flagging tape utilized is composed of biodegradable material;
- vii) Workers are prohibited against disturbing or harassing wildlife;
- viii) The *Provincial Archeology Office* shall be notified of any historic resource discoveries;

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- ix) Cutting in sensitive areas (water courses and associated buffers, wetlands and associated buffers or areas of high archaeological potential) will be prohibited unless there is notification and approval from the HSE Manager. This would require an appropriate permit from the Forestry Services Branch of NLDNR;
- x) Workers using vehicles must yield to the right-of-way of wildlife;
- xi) Unless approved by the HSE Manager, ATVs are not permitted to travel off the road ROW and to minimize ground disturbance, they must be restricted to designated trails; and
- xii) Use of ATVs must comply with the *Environmental Guidelines for Stream Crossings by All-Terrain Vehicles* issued by the NLDOEC, as well as the *Motorized Snow Mobile and All-Terrain Vehicle Regulations, 1996*, under the *Motorized Snow Mobile and All-Terrain Vehicle Act*.

2.2 Line Cutting

2.2.1 Potential Environmental Concerns

As with surveying and vegetation clearing, line cutting has the potential to disturb wildlife species, historic resources and existing vegetation.

2.2.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts of surveying include the following (SMEGAC, 2012):

- i) All lines will be hand cut utilizing chain saws and hand tools;
- ii) Low impact cutting techniques such as avoidance of cutting merchantable trees and branch removal instead of cutting the tree shall be used;
- iii) Low impact equipment such as all-terrain vehicles or snow machines shall be utilized when not accessing by foot;
- iv) Cross lines shall not exceed a width of 1.0 meters and baseline and lease boundaries shall not exceed a width of 2.0 meters;
- v) Within 100 m of either watercourse, line widths shall not exceed 1.0 meters and where possible, natural features will be used to conceal visual sight of line;
- vi) Standing timber damage will not occur;
- vii) Any slash or standing trees after cutting that don't fall will be laid flat on the ground;

- viii) At any location where line cutting enters or exits either watercourse, there will be minimal vegetation disturbance; and
- ix) Yarding and felling of trees will be away from watercourses.

2.3 Vegetation Clearing

2.3.1 Potential Environmental Concerns

The potential negative impacts of vegetation clearing include uncontrolled burning, stockpiling vegetation in or near watercourses and the potential for clearing to be scheduled in bird-nesting areas during nest periods. Eagleridge will stay in contact with Environment Canada for updates on any changes to the typical nesting period based on unusual weather patterns.

2.3.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts from vegetation clearing include the following:

- i) Removal of trees and clearing shall be kept to a minimum at all times;
- ii) Avoid the removal of mature trees;
- iii) Any trees that have a stump diameter of 150 mm will be salvaged;
- iv) Clearing and removal of trees shall only be facilitated for minimum areas required for site development and access;
- v) A Cutting Permit must be acquired before any clearing is facilitated from NLDNR and be strictly adhered to;
- vi) As required by the operating permit, water delivery systems and fire-fighting tools shall be made available at the equipment laydown area as well as on ATVs for safety and potential distribution to other areas of the site as needed;
- vii) Vegetation clearing must comply with appropriate permits such as the Permit to Burn;
- viii) Burning shall only be facilitated when weather is appropriate and must be overseen and directed by the Forestry Services Branch of NLDNR;
- ix) The clearing process will encompass cutting within 15 cm (150 mm) of the ground and removal of vegetation, shrubs and debris from the site;
- x) To ensure neat piling, all brush and trees shall be cut into lengths as detailed in the *Cutting of Timber Regulations* under the *Forestry Act*;

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- xi) To allow for lateral drainage and wildlife passage, at every 200 m, a 6.5 m break in slash piles will be made, and they will be stored on alternating sides of the ROW. The maximum height of the piles shall not exceed 3 m;
- xii) The *Environmental Protection Guidelines for Ecologically Based Forest Resource Management* (1998) will be followed;
- xiii) The Forest Resources Division of NLDNR will be notified if any merchantable or usable timber is incidentally removed during vegetation clearing activities at (709) 497-8479;
- xiv) The *Forest Fire Regulations, 1996* (amended 2002), under the *Forestry Act, Environmental Code of Practice for Open Burning and Permit to Burn* (NLDNR) must be complied with when disposing of slash and cuttings and un-merchantable timber by burning. A fire shall never be left unattended;
- xv) Debris or material such as slash from clearing activities shall not enter any watercourse through blockage by sediment control structures and barriers, and to encourage future rehabilitation efforts, this material shall be piled above spring flood levels;
- xvi) Vegetation clearing must be done by hand around watercourses and wetland areas to within 30 m of the waterbody, unless authorized by the local Forestry District Office as specified on the Cutting Permit;
- xvii) Debris, slash and other construction material shall be placed a minimum of 30 m away from any water body or watercourse;
- xviii) Within a tree length and a half from the proposed resource access road, trees that are not the indicated clearing widths shall be flagged. Clearing and excavation limits shall be clearly shown in the field by flagging with blue ribbon for buffer zones and red ribbon for clearing limits;
- xix) All workers responsible for clearing vegetation will have access to spill kits available at nearby locations, to be determined prior to initiation of clearing activities;
- xx) Features indicative of either an archaeological or cultural site shall not be disturbed or destroyed by workers. These features include tools, pottery, structures, animal bones or graves, etc.;
- xxi) The disturbance of wetlands will be avoided outside work areas. If necessary, the proper permit will be obtained from NLDOEC; and
- xxii) To avoid damage to standing trees, timber shall be felled towards the work area.

2.4 Grubbing and Disposal of Related Debris

2.4.1 Potential Environmental Concerns

The potential negative impacts of grubbing and disposal of related debris (organics, wood, rocks, other natural materials) include the potential to disturb historic resources and negative effects on water quality and freshwater ecosystems by sediment release into watercourses.

2.4.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts from grubbing and disposal of related debris include the following:

- i) To satisfy project engineering requirements, grubbing on erodible or unstable soil shall be limited. This will typically be facilitated by surveying soil erodibility and stability to highlight unstable areas, which shall be mitigated using erosion control measures;
- ii) Grubbing activities will be in compliance with buffer zone requirements (as described in Section 2.5);
- iii) Activities regarding the disposal of non-woody debris will be in compliance with the *Environmental Protection Act*;
- iv) Grubbing shall be restricted to a limited area for the upper soil horizons and or the organic vegetation mat;
- v) Under federal regulation, notice is required regarding the mortality of any endangered species. If migratory bird mortality is discovered, the HSE Manager will contact the Canadian Wildlife Service (CWS) of Environment Canada at 709-772-5585 or 1-800-668-6767. All injured or dead birds, other than species at risk, found within municipal boundaries are dealt with by the municipal animal control office;
- vi) Surpluses of grubbed material containing upper soil horizons or portions of the organic vegetative mat shall be stockpiled and stored for re-vegetation and restoration purposes. Their locations shall also be recorded and they will be left accessible for future use;
- vii) Organics and topsoil will be stored in 1 to 2 m high stable piles;
- viii) Aside from overburden, peat and topsoil shall be stockpiled separately, and then separated from any watercourse, water body or ecologically sensitive area by a buffer of at least 30 m ;

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- ix) Standing timber shall be separated by a minimum of 5 m from stockpiles of grubbed material ;
- x) To decrease the effect of compaction on structure, topsoil and or grubbed material will be stored in low piles. Through use of erosion control methods or seeding, topsoil stockpiles will be protected;
- xi) By utilizing infrastructure such as settling ponds, interception ditches and filter fabrics, runoff of sediment-laden water during grubbing shall be reduced. For areas that are prone to soil loss, erosion control measures shall be used. These include: filter fabrics, drainage channels, rip rap as well as gravel or wood chip mulches;
- xii) When stockpiling of grubbed material occurs, numerous roots and stumps shall be left on the ground surface to promote natural re-vegetation, maintain soil cohesion and dissipate the energy of runoff;
- xiii) To ensure that no surface water ponding takes place, stockpiles shall be shaped;
- xiv) To avoid becoming anaerobic, stockpiles shall not be covered with materials such as plastic;
- xv) Material that has been grubbed is not to be pushed into locations that are meant to be left undisturbed, and shall be buried with 60 cm of soil cover;
- xvi) To prevent and isolate any runoff from entering adjacent water bodies or watercourses, topsoil shall be stripped, stockpiled, secured and surrounded by filter fabric;
- xvii) To prevent the migration of soils, filter fabric fencing composed suitable woven geotextile shall be utilized at the lower sections of grubbed areas;
- xviii) Where water is flowing, grubbing shall not be facilitated in any stream or tributary to a stream or in any temporary buffer zone (buffer widths are outlined in Section 2.5 below);
- xix) Avoid grubbing on steep slopes near watercourses; and
- xx) Where feasible, be cognizant of the value of wetlands and avoid their disturbance.

2.5 Buffer Zones

2.5.1 Potential Environmental Concerns

Buffer zones are boundaries of undisturbed vegetation maintained along water bodies. A negative impact from a lack of buffer zones is that lakes, ponds and streams will

become sediment and silt laden resulting from runoff. Buffer zones are important because they provide cover for aquatic life such as fish.

2.5.2 Environmental Protection Procedures

Practices to employ to lessen potential environmental impacts include the following:

- i) Prior to any disturbance activities, buffer zone areas shall be flagged and established by the Construction Contractors in consultation with the HSE Manager and Construction Supervisor to indicate areas where trees will not be cut;
- ii) Between work areas and water bodies, there shall be a minimum buffer zone of approximately 20 m of natural vegetation that is undisturbed;
- iii) As required, outside buffer zones, sediment control devices shall be built. These devices function to prevent sediment from entering water bodies and will control runoff from areas of exposed soils;
- iv) Silt shall be regularly removed from devices such as silt fences by Construction Contractors as instructed by the EM after conducting inspections. This material will be disposed of at the Robin Hood Bay Facility. Unless the material can be re-used, the company will be charged a disposal fee and a permit is required for trucks to enter the facility;
- v) Around any bulk fuel storage activities, there shall be a minimum buffer zone of 100 m which is maintained from the high water mark or watercourses, water bodies and ecologically sensitive areas;
- vi) A "no-grub" buffer zone of 30 m of undisturbed ground vegetation will be maintained at both water body crossings;
- vii) Disturbance to vegetation within a permanent buffer zone shall be eliminated or minimized at all water crossings where work is being carried out;
- viii) A permanent buffer zone between the edge of an adjacent waterbody and the proposed resource access road will be maintained;
- ix) Formula 1.1 below shall be used when the side slope is greater than 30%:
 - **Formula 1.1: Width of Buffer Zone (m):** $20m + 1.5 \times \text{Slope Gradient (\%)}$, where Slope Gradient equals the % grade of the local natural ground.
- x) If this is not possible due to highly erodible soils, clearing limits shall be reduced in order to maximize the buffer.

Table 2.1 below illustrates the approximate buffer zone widths that are recommended based on activities near watercourses.

Table 2.1 Buffer Zone Width Recommendations

Activity	Buffer Zone Width Recommended
Placing of site trailers fuel storage	100 m
Slash grubbing and wood piling	30 m
Resource access road running adjacent to water bodies	20 m + 1.5 x slope (%)
In urban or other developed areas, developments located around water bodies	20 m but depends on site specific considerations

Modified from Rambler, 2011.

2.6 Equipment Laydown Areas

2.6.1 Potential Environmental Concerns

An equipment laydown area will be utilized for maintaining and storing supplies and equipment during Project activities. It is essential to prevent the potential for sediment runoff into nearby watercourses or water bodies as well as erosion. The approximate location of the equipment laydown area for the Big Triangle Pond site is presented in Figure 1.3. The location will be approximately 20 m in length, parallel to the proposed road, and 10 m in depth. Once the location is established in the field, the Crown Lands Division of the NLDMIGA and the EA Committee will be provided with the area's coordinates.

2.6.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts resulting from the use of laydown areas include the following:

- i) To keep free of runoff and ponding, the laydown area will be graded as necessary to control drainage and will be managed to limit the possibility of suspended solids being introduced into adjacent waterbodies. Runoff will be directed to ditches that will drain to surrounding vegetated areas for natural filtration. Prevention and mitigation strategies for control and treatment of the suspended solids will also be applied, as required (e.g., ditch blocks, filter cloths);
- ii) When the equipment laydown area is no longer required for operation or construction activities, it shall be rehabilitated; and

- iii) When establishing any new laydown areas, appropriate procedures for grubbing, vegetation clearing and erosion prevention shall be followed.

2.7 Overburden

2.7.1 Potential Environmental Concerns

The potential negative impact of overburden placement is that it has the potential to result in siltation of aquatic environments causing a decrease in water quality, an impact on the substrate, the displacement of wildlife and the loss of habitat. Placement of overburden and spoil areas will be in the form of piles (windrows) within the proposed resource access road ROW and determined on site during construction by the Construction Contractors in consultation with the Construction Supervisor.

2.7.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts from the placement of overburden include the following:

- i) To prevent the ponding of surface water while awaiting use for site restoration efforts, overburden shall be stored in stable piles and sloped within the proposed road ROW;
- ii) Areas where overburden is stored shall be a minimum of 30 m away from any water body or watercourse and located on well-drained soil;
- iii) To manage surface runoff from overburden stockpiles, use of settling ponds and collection ditches shall be facilitated, as needed; and
- iv) Overburden storage locations will be secured as appropriate.

2.8 Excavation, Embankment and Grading

2.8.1 Potential Environmental Concerns

The potential negative impact of excavation, embankment and grading is the potential for runoff of sediment-laden water which will negatively affect both water quality and aquatic ecosystems.

2.8.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts of excavation, embankment, and grading include the following:

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- i) Upon completion of stripping and grubbing is the only time excavation, embankment and grading will be facilitated;
- ii) Filling shall occur with no disturbance to the upper soil horizons or vegetative mat;
- iii) As necessary, all sediment control structures shall be checked, repaired and upgraded before excavation or filling is facilitated by the Construction Contractors;
- iv) In the general area of the stream crossings, excavation, embankment and grading shall occur such that there is a reduced risk of erosion and sedimentation of watercourses and water bodies, which is in compliance with the NLDOEC and Department of Fisheries and Oceans (DFO);
- v) Absolutely no material shall be deposited into any watercourse or water body;
- vi) Stabilization measures shall be used for all stream bank sections containing erodible or loose material;
- vii) To direct natural drainage around work areas, mitigation measures such as sediment fences shall be implemented before excavation or grubbing occurs;
- viii) By re-vegetating disturbed areas as necessary, limiting the area exposed at any one time and stabilizing exposed soil with anti-erosion devices (for example: rip rap, filter fabrics, gravel, wood chips, etc.), soil disturbance shall be minimized;
- ix) To prevent mixing and for later restoration efforts, all excavated materials will be sorted into separate stockpiles, for example: waste rock, overburden, topsoil;
- x) Works within 15 m of a stream crossing will be done in such a manner that erosion and sedimentation of watercourses and water bodies is minimized and adheres to requirements outlined in NLDOEC and DFO permits and approvals;
- xi) Near watercourses or water bodies, the use of heavy equipment will be reduced or minimized. Also, heavy equipment is not allowed within a watercourse or water body without a fording permit;
- xii) Schedule construction activities in and around waterbodies such that they do not overlap with sensitive life functions such as spawning. The general construction timing window to protect most species in the area is June 1st to September 30th (i.e., no in-water works between October 1st and May 31st). If there are concerns that construction will take place outside of the timing window, DFO will be contacted to discuss any changes and appropriate mitigation measures;
- xiii) Work shall not be conducted below the high water mark of any surface water features; and

- xiv) Spoil areas shall be used to dispose of excavated waste material. Location and number of spoil areas on site will be determined by the on-site Construction Contractors in consultation with the Construction Supervisor during construction. Their locations will be located within the proposed resource access road ROW.

2.9 Trenching

2.9.1 Potential Environmental Concerns

The main negative impact from trenching is the potential for the runoff of sediment-laden water, resulting in effects on marine and freshwater fish habitat, water quality and historic resources.

2.9.2 Environmental Protection Procedures

While trenching activities for this project will be facilitated almost solely along the proposed resource access road only to minimize environmental disturbance, practices to employ to lessen potential environmental impacts include the following:

- i) For future use during rehabilitation, topsoil and excavated overburden and bedrock shall be stored in separate stockpiles;
- ii) To ensure that the final grade of the trench is level with the surrounding surface, backfilling of linear trenches shall allow for settlement. As per the standard guidelines, *Environmental Guidelines for Construction and Mineral Exploration Companies (EGCMEC)*: The material will be replaced in the reverse order that it was excavated. After backfilling and compaction is completed, the surface will be stabilized. If natural regeneration appears unlikely, then the entire trench surface area will be re-vegetated; and
- iii) Acceptable sediment control measures will be utilized to reduce and control the release of sediment-laden water when dewatering trenches.

2.10 Drilling

2.10.1 Potential Environmental Concerns

The potential negative impacts of drilling include generation of noise and dust, surface disturbance, disposal of drill cuttings and fluids and potential impacts to aquatic ecosystems, terrestrial habitats, air quality and historic resources.

2.10.2 Environmental Protection Procedures

Practices to employ to lessen potential environmental impacts from drilling include the following:

- i) A self- assessment will be required if water withdrawal is necessary, and DFO may require a request for project review. If DFO issues a letter of advice, all included conditions will be followed;
- ii) The Water Resources Management Division of the NLDOEC requires a water use license for drilling activities which will be obtained;
- iii) Drilling mud, encompassing both return water and drill cuttings, shall be treated with a polydrill filter box or other appropriate alternative, if available;
- iv) Treated water shall be disposed such that it promotes natural permeation into overburden soils and prevents entry into surrounding water bodies;
- v) The *Environmental Control Water and Sewer Regulations, 2003 (ECWSR)* conditions shall be met regarding all potential discharges resulting from drilling activities;
- vi) Oil drops and leaks have the potential to occur due to the nature of drilling activities and therefore all drill rigs shall be equipped with spill kits and the location shall be cleaned up at every opportunity;
- vii) In the event of a loss of hydraulic fluid or hose rupture, response actions outlined in Section 3.6, Fuel and Hazardous Material Spills will be followed;
- viii) Any abandoned drill holes will be capped and/or sealed where required;
- ix) All drilling sites will be prepared by clearing of the trees and cribbing of the drill rig on timbers or lumber without any ground disturbance;
- x) To control dust, water applications shall be utilized. In winter months, approval is required by the NLDOEC as water-based drilling dust suppression systems have the potential to require anti-freeze. The use of water for dust control shall be undertaken in a manner that ensures return water does not enter watercourses;
- xi) To minimize noise, drilling equipment shall have muffled exhaust; and
- xii) No persons will permit the deposition of oil or oil wastes as they are detrimental to migratory bird in any areas or waters frequented by migratory birds;

2.11 Vehicle Traffic

2.11.1 Potential Environmental Concerns

The potential negative impacts of vehicle traffic include noise, emissions and fugitive dust.

2.11.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts resulting from vehicle traffic and use include the following:

- i) All equipment and vehicles will be required to yield to any wildlife;
- ii) Equipment and vehicle use, including ATVs, must be restricted to routes that are designated within and between work, maintenance, and the laydown area;
- iii) To meet emission standards, all vehicles on site must be properly maintained and inspected by Construction Contractors, including all muffler and exhaust systems and confirmation of inspection will be kept with each vehicle and piece of equipment;
- iv) Except as required by in the performance of the work, ATVs shall not be allowed on site;
- v) ATVs shall be in compliance with the *Environmental Guidelines for Stream Crossings by All-Terrain Vehicles*;
- vi) When present, all equipment and vehicles must yield to people and speeds shall be reduced on all roadways to 30 km/hr (DFRL). This shall also be established through road signage to reduce both accidents and environmental disturbance;
- vii) It is prohibited to harass or chase wildlife with equipment or vehicles;
- viii) Heavy equipment such as front-end loaders and dump trucks must only be utilized in work areas;
- ix) Minimize, if at all possible, heavy equipment use in or near watercourses. If possible, utilize an excavator from the shore in place of a bulldozer operating within the watercourse;
- x) Watering the roads will be implemented, if required, as a dust suppression measure;
- xi) Authorization to re-fuel and maintain vehicles is restricted to the fuel storage area, if absolutely necessary, although the intention is that vehicles will arrive at site fully fueled. The location is presented on Figure 1.3; and

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- xii) If signs of erosion appear, all routes will be monitored and appropriate action will be taken to repair the road.

2.12 Noise Control

2.12.1 Potential Environmental Concerns

The potential negative impact of noise is effects on wildlife in relation to their abundance and distribution.

2.12.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts of noise include the following:

- i) Compliance with all approvals and permits;
- ii) All contractors working on site will be responsible for compliance with relevant legislation with respect to noise;
- iii) All generators and vehicles will be inspected by Construction Contractors to ensure that mufflers will be operating properly and that exhaust systems are in working order. Confirmations of inspection will be kept with each generator and/or vehicle;
- iv) Workers will use appropriate hearing protection when excessive noise cannot be avoided;
- v) Noise abatement equipment, in good working order, shall be used for all heavy machinery used during the project;
- vi) Well-maintained and standard noise suppression devices shall be provided for all equipment on site;
- vii) Keep to a minimum the idling of construction vehicles;
- viii) To minimize noise, all vehicles shall follow a designated project route and shall be properly maintained;
- ix) During maximum periods of activity, the routing of truck traffic shall be properly controlled;
- x) Limit major noise generating activities to between 7:00 am and 10:00 pm; and
- xi) Before and after extreme noisy activities, the area will be surveyed for wildlife by the EM. As directed by the HSE Manager, activities will be postponed until wildlife has left the particular area.

2.13 Dust Control

2.13.1 Potential Environmental Concerns

The potential negative impacts of dust include effects on vegetation and aquatic ecosystems as well as potential human health effects.

2.13.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts of dust include the following:

- i) To reduce air-borne particulates, transport trucks will be covered. This is especially relevant if trucks are carrying fine-grained soils and granular materials;
- ii) Water will be used to control dust from operating activities and applied to work and travel surfaces using water trucks with sprinklers in the event of excessive dust;
- iii) Waste oil will not be used for dust control. Dust control agents will include: matting, wood chips and/or re-vegetation;
- iv) All vehicles will not exceed the 30 km/hr maximum speed limit;
- v) If water used for dust control is extracted from a waterbody, the Water Resources Management Division of the NLDOEC will be consulted to see if a Water Use License is required;
- vi) To prevent blowing dust, stockpiled material will be covered or moisture conditioned;
- vii) The Construction Contractors will determine and monitor locations where water is to be applied for dust generation and will remedy any situations where nuisance dust levels are identified;
- viii) If surface water utilized for dust control could freeze and present traffic hazards, water will not be applied;
- ix) Because dust exposure has the potential to affect human health, all workers potentially exposed shall wear appropriate personal protective equipment (PPE);
- x) To provide a uniform application of water, water will be applied through a pressure type distributor, which contains a spray system of nozzles. To avoid surface runoff of sediment, only minimal amounts of water will be applied;

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- xi) The amount of vegetation to be cleared shall be minimized as trees and shrubs will act as windbreaks to prevent natural erosion, thus controlling dust generation;
- xii) Protection against wind erosion shall be provided for both stockpiles and exposed soil. Prevailing wind directions shall be taken into account regarding the location of stockpiles;
- xiii) Weather conditions such as strong winds in dry weather shall be taken into account as they have the ability to produce high levels of dust; and
- xiv) Monitoring of weather forecasts and conditions shall also be facilitated to determine periods of high wind so that dust suppression measures shall be implemented.

2.14 Watercourse Crossings

According to the *Water Resources Act*, a “body of water” means a surface or subterranean source of fresh or salt water within the jurisdiction of the province, whether that source usually contains liquid or frozen water or not, and includes water above the bed of the sea that is within the jurisdiction of the province, a river, stream, brook, creek, watercourse, lake, pond, spring, lagoon, ravine, gully, canal, wetland and other flowing or standing water and the land occupied by that body of water. (<http://assembly.nl.ca/Legislation/sr/statutes/w04-01.htm>)

Regarding any work around a body of water, Eagleridge will follow and comply with the *Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador* (<http://www.dfo-mpo.gc.ca/Library/240270.pdf>), and relevant DFO Factsheets presented in Appendix E.

2.14.1 Potential Environmental Concerns

The construction of watercourse (stream) crossings have the potential to result in mortality of fish, potential loss of fish habitat as a result of habitat removal, and loss stream bank vegetation. Soil erosion and sedimentation are also potential environmental concerns.

The proposed resource access road at Big Triangle Pond will have two water crossings: Tributary 1 and Tributary 2 of Southern Peak Pond. An approximate 9 m arch culvert will be installed at Tributary 1 to Southern Peak Pond, and a 16 m bailey bridge will be used to cross Tributary 2 to Southern Peak Pond. Both water crossing locations are depicted on the Figure 1.3 and the map in Appendix B.

2.14.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts of watercourse (stream) crossings include the following:

- i) Compliance with specific conditions and requirements in the acquired approvals from DFO and NLDOEC is required for all fording activities;
- ii) A permit to Alter a Body of Water is required under the *Water Resources Act* from NLDOEC, Water Resources Management Division for any work in any body of water (including wetlands) that is visible on 1:50,000 scale maps;
- iii) Fording of any watercourse must follow the *Environmental Guidelines for Fording* from NLDOEC, Water Resources Management Division;
- iv) Assessment and notification are required from the HSE Manager if any work is to take place below the high water mark or any surface water feature;
- v) To reduce the time the watercourse is disturbed and therefore reduce the potential for sediment entry, attention shall be paid to scheduling. The ideal conditions are low rainfall and low flow periods;
- vi) Direct supervision is required by the HSE Manager during sensitive fish life stages to reduce the potential impacts of stream crossings;
- vii) During watercourse crossing work, prohibit the entry of harmful substances such as fuel and sediment through silt fences;
- viii) A minimum buffer of undisturbed natural vegetation will be left between the access road and bank of any watercourse it parallels. The buffer width will be determined by Formula 1.1, presented in Section 2.5.2;
- ix) Do not alter the natural flow regime of the watercourse;
- x) In or around any watercourse, the use of heavy equipment shall be reduced or restricted;
- xi) Areas of spawning habitat will be avoided, and work upstream of spawning habitats will be closely monitored during sensitive periods (as outlined in Section 2.8.2);
- xii) Crossings shall be made at right angles to the watercourse as well as restricted to a single location;
- xiii) To limit equipment activity within the watercourse, the number of crossings will be minimized;

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- xiv) If necessary, stabilize entire fording area using corduroy roads, vegetation mats or coarse material, all consisting of an approximately 120 mm diameter or greater;
- xv) Fording under existing substrate conditions will only be facilitated by direction of the Construction Supervisor in scenarios where either coarse material is not available within lease boundaries or the substrate of the ford is not subject to easy disturbance by fording;
- xvi) Fording activities are prohibited from decreasing the depth of the watercourse to less than 20 cm. If the existing depth of the watercourse is already 20 cm, the depth shall be maintained; and
- xvii) Any bank sections that consist of erodible or loose materials shall be stabilized through structures previously mentioned.

2.14.3 Environmental Protection Procedures for Culvert Installation

- i) Compliance must be met with the required Permit for Culvert Installation from the NLDOEC, Water Resources Management Division, as well as approval from both NLDOEC and DFO to install stream crossings;
- ii) Applications must be made to DFO as well as NLDOEC, Water Resources Management Division, and permits to alter bodies of water must be obtained to install culverts in locations, which are within fish habitat. Design for culverts must be signed and stamped by a registered Professional Engineer and sized in compliance with the *Environmental Guidelines for Culverts* from the NLDOEC;
- iii) Culvert installation must be in compliance with sound environmental and engineering practices and address issues such as the possible velocity barrier to fish migrations;
- iv) Site specific information including fish habitat type, species present and localized stream gradient is required before culvert installation is facilitated;
- v) To prevent erosion of fill slopes, rip rap inlets and outlets shall be used;
- vi) To limit seepage and subsequent wash-outs, backfilling material shall be a texture to support the culvert;
- vii) To not significantly alter the original direction of stream flow, culverts shall be appropriate aligned;
- viii) Debris and fill removed from culvert areas will be placed at an area above the peak flow levels to prevent its entry into streams;

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- ix) Fill material shall not be taken from banks or streambeds;
- x) Where necessary, to settle out sediment-laden water, sedimentation basins shall be used;
- xi) The release of sediment laden water into a waterbody, watercourse or ecologically sensitive area, due to construction and exploration activities, shall comply with applicable discharge guidelines as represented in the Newfoundland and Labrador *Environmental Control Water and Sewage Regulations, 2003* under the *Water Resources Act*; and
- xii) During the winter, culverts shall be marked to highlight their position within the snow.

2.14.4 Environmental Protection Procedures for Bridge Installation

- i) A permit is required from the NLDOEC, Water Resources Management Division for any proposed bridge installations. DFO also requires a self-assessment be conducted and may require a request for project review. All conditions will be followed under the NLDOEC permit and a letter of advice from DFO, if issued;
- ii) The on-site EM will be responsible for taking photographs of the bridge installation before and after the installation is completed;
- iii) The following guidelines will be followed during design and construction of the bridge: NLDOEC *Environmental Guidelines for Bridges and Watercourse Crossings*, DFO's Factsheet for bridge construction and demolition and DFO's clear span bridges operational statement;
- iv) Bridges shall consider the design criteria listed below:
 - At the time of installation, deck height shall be a minimum of 450 cm above the water surface;
 - Deck height will be a minimum of 250 cm above the bank height;
 - Abutments logs will be laid a minimum of 1 meter from the top of the bank.
- v) The installation will take into account site-specific conditions such as topography;
- vi) To prevent erosion and scouring, the downstream and upstream sides of abutments will be protected with erosion control structures;
- vii) If roadside ditches are utilized where they discharge into the watercourse near the bridge, adequate erosion protection structures will be used;

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- viii) Conditions for abutment construction will be in the dry during periods of low flow;
- ix) Any disturbed areas will be returned to a state resembling natural and local conditions; and
- x) The bridge will be removed during site decommissioning.

2.15 Erosion Protection and Sediment Control

2.15.1 Potential Environmental Concerns

The potential for erosion and sedimentation is a significant issue as it results in siltation of water bodies from eroded material which has the potential to affect and decrease suitable habitat for both terrestrial and aquatic animals. The building of roads has the potential to lead to the erosion of soils into surrounding watercourses which greatly impacts fish and fish habitat (Gosse, Power, Hyslop and Pierce, 1998). Suspended sediment in the water reduces transparency and clarity, which has the ability to cause extensive damage to fish's gills (Gosse et al., 1998). If and when sediment reaches the bottom of watercourses and settles, this can smother fish eggs as well as cause unsuitable substrates for spawning activities (Gosse et al., 1998).

Regarding any work around a body of water, Eagleridge will follow and comply with the *Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador* (<http://www.dfo-mpo.gc.ca/Library/240270.pdf>), and relevant DFO Factsheets presented in Appendix E.

As noted above in Section 1.5.2, the *Environmental Control Water and Sewage Regulations, 2003* will be strictly adhered to with particular attention surrounding the stream locations presented on the Streams Identified Using Geospatial Analysis figure in Appendix B.

2.15.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts of erosion and sedimentation are numerous and include the following:

- i) Conditions set out for the operation and construction activities of a project must follow approvals and/or permits as well as authorizations including, but not limited to, a Permit to Alter a Body of Water under the *Water Resources Act* for any work in any body of water (including wetlands) that is visible on 1:50,000

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- scale maps from the NLDOEC, Water Resources Management Division, as well as the Construction Contractors' SOPs;
- ii) To control erosion, the primary way is to avoid any activity that contributes to erosion, therefore reducing or eliminating disturbance to any new areas;
 - iii) If required, to reduce soil erosion, drainage ditches shall be stabilized through measures such as: installing rock check dams, interceptors swales, terracing as well as lining with rock or vegetation, which shall all be maintained after initial installation;
 - iv) To meet engineered slope requirements, any and all locations with exposed erodible soil shall be stabilized by compacting, grading or back-blading;
 - v) If it is discovered that silt is entering any water body or watercourse, typically through environmental inspection by the EM, there will be implementation of mitigation measures such as ditch blocks/check dams, temporary drainage ditches, straw bales and siltation control (settling) ponds to intercept any runoff;
 - vi) Any storage, work or laydown area shall be monitored for erosion and if necessary, appropriate repair action taken;
 - vii) The EM shall inspect and monitor new or existing siltation control structures to check for excessive accumulation of sediment and examine the state of the structure to determine if a collapse and/or undermining of the fence is imminent. To reduce this problem, consideration will be given to the utilization of steel mesh reinforced silt fences or straw bales for support. To enhance effectiveness of structures, excess sediment will be removed. Also, before entering any water body or watercourse, any effluent from these structures shall be released to flow overland to allow for natural filtration;
 - viii) The EM will utilize the Site Check List Form for Monitoring of Sedimentation and Erosion Control Structures, presented in Appendix F to inspect and monitor new or existing sediment and erosion control structures;
 - ix) Before excavation of any sediment, excess water shall be removed from siltation control systems by the contractor on site and to prevent the loss of wet sediment during transport, trucks will be equipped with liners;
 - x) To channel drainage into vegetated areas, drainage collectors shall be installed across disturbed areas;
 - xi) Utilization of appropriate rip rap to stabilize exposed soils at drainage locations;
 - xii) To direct disturbed drainage courses back into the natural course, re-routing shall be facilitated as necessary;

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- xiii) To construct check dams to restrict slurry or mud at locations such as culverts, inlet, unsodded ditch lines, catch-basins, hay or straw bales shall be used;
- xiv) Straw bales shall be constructed such that they are dug into the earth approximately 10 cm and then anchored using wooden stakes or other applicable material;
- xv) Check dams shall have sediment cleaned out on a regular basis;
- xvi) Pump silted water to either designated vegetated areas or settling ponds; and
- xvii) To make sure protection measures are in place and to ensure they withstand storm events, extended weather forecasts shall always be consulted.

2.15.3 Detailed Methodology

As mentioned, the following sections discuss the various structures, which will be utilized to mitigate against the potential for sedimentation and erosion. These structures include: silt fences/filter fabric dams, check dams, settling ponds, ditches and straw barriers/bale structures. Each mitigation structure will have a description, followed by guidelines, which will be followed to ensure their proper installation and maintenance.

2.15.3.1 Silt Fence/Filter Fabric Dams

Silt fences and filter fabric dams are defined as temporary barriers which provide an effective filter for runoff that is sediment laden, originating from disturbed surfaces and slopes (Gosse et al., 1998). In development areas, these structures are oftentimes installed near the bottom of slopes and are composed of filter fabric with posts and stakes (Gosse et al., 1998). To prevent the sedimentation of aquatic environments via potential site runoff, these structures surround contoured exposed slopes or disturbed sites to trap incoming sediment close to the erosion source (Gosse et al., 1998). These fences are also utilized in ditches to remove sediment from collected water before this water is subsequently released into natural water bodies (Gosse et al., 1998). Silt fences and filter fabric dams are not intended for the long-term control of sedimentation as they have a limited retention capacity and also require long-term maintenance (Gosse et al., 1998).

The following guidelines have been designed to ensure filter fabric structures are utilized effectively (Gosse et al., 1998):

- i) These structures are designed for temporary use;

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- ii) To ensure maximum sediment removal, more than one filter fabric dam will be installed, or filter fabric dams installed in a series prior to entry of collected water into a receiving water body;
- iii) Filter fabric structures do not function effectively in areas of continuous flow or moderate to high water velocities and will not be utilized in natural water bodies;
- iv) Utilization of filter fabric structures will be restricted to situations where only surface runoff is expected;
- v) Installation of filter fabric/silt fences will be at the lower perimeter of slopes, which constitutes the low third to half of the site;
- vi) For the installation of ditches, to prevent the movement of fines under or around the dam, the filter fabric dam will be effectively embedded in the ditch bottom and sides, to a 100 mm minimum. On the downstream side of the trench, wooden stakes will be installed and the filter fabric will be attached to the upstream side of the stakes;
- vii) To prevent movement of fines through or around the seam area, section adjoinments of filter fabric will be sufficiently overlapped, to a minimum of 150 mm;
- viii) Sediment that accumulates will be properly removed on a regular basis from the structure by Construction Contractors and disposed of such that it inhibits entry into the water bodies. This material will be disposed of at the Robin Hood Bay Facility. Unless the material can be re-used, the company will be charged a disposal fee and a commercial permit is required for trucks to enter the facility;
- ix) Any sections of the fabric, which become damaged, will be replaced or repaired immediately. The dams will also be inspected by an on-site EM to ensure water is not flowing around or under the filter fabric and will also check the functionality of its retention ability; and
- x) Until disturbed areas are stabilized and all site work has been completed, silt fences and filter fabric dams will not be removed. Prior to removal, all sediment will be removed and disposed of as indicated above.

2.15.3.2 Check Dams

Check dams are either utilized on a temporary or permanent basis and their purpose is to prevent erosion and control sedimentation arising from road side ditches (Gosse et al., 1998). These structures prevent ditch bottom erosion through holding and collecting

moisture and sediment as well as by slowing the velocity of concentrated runoff (Gosse et al., 1998). Construction is based on whether the structure will be temporary or permanent, with the consideration of material availability (Gosse et al., 1998). They are typically constructed of locally, available materials and oftentimes are economical to construct (Gosse et al., 1998). Examples of materials utilized include: planks, gabion baskets, brush, rock, sodden earth fill or sandbags (Gosse et al., 1998).

The following guidelines have been designed to ensure check dams are utilized effectively (Gosse et al., 1998):

- i) Check dams will not be utilized in natural water bodies and are best suited to treating runoff from small drainage areas. As a result, several small check dams will be used as required to be more effective than a few large dams, to maximize sediment trapping capacity and reduce runoff;
- ii) Construction of check dams will be facilitated to provide an impermeable structure and will be lined with impermeable materials such as polyethylene or plastic sheeting. To enable accumulated water movement over the dam, the center of the check dam will be lower than the sides while settled sediment is retained by the lower portion and sides of the dam;
- iii) Check dams will be stabilized with either riprap or other materials which are non-erodible in nature; and
- iv) Check dams will be inspected regularly by the on-site EM to ensure accumulated sediment is properly removed and transferred to a landfill site to enhance the effectiveness of the structure. Removal of accumulated sediment will also be facilitated before a temporary check dam is removed from the site.

2.15.3.3 Settling Ponds

The purpose of settling ponds or basins is to intercept and retain sediment-laden runoff (Gosse et al., 1998). By allowing sediment to settle out, these structures reduce the amount of sediment coming from disturbed areas which in turn, protects fish habitat (Gosse et al., 1998). Settling pond effectiveness is influenced by surface area, particle size, settling characteristics and settling time (Gosse et al., 1998). At the development area, these structures will be installed before excavation or other construction related activities (Gosse et al., 1998). These structures function best for sedimentation control on a relatively short-term basis (Gosse et al., 1998).

The following guidelines have been designed to ensure settling ponds are utilized effectively (Gosse et al., 1998):

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- i) During the initial site development, settling ponds will be installed before any grubbing of the area occurs;
- ii) Construction of these structures will ensure that the length is at least four times the width;
- iii) If long-term activity in the duration of several weeks or more is planned, settling ponds are most effective when multiple structures are used in series, with a minimum of two ponds;
- iv) To retain sediment and water, the bottom of settling ponds will be lined with a material such as plastic;
- v) Near the top of a settling pond, a pipe will be installed such that water is discharged from the top of the water column. However, there are multiple alternatives to this construction method which use various detection devices such as pre-cast manholes or natural topographic features;
- vi) The rate at which sediment particles settle out of the water column may be increased by use of a chemical additive, known as flocculant. Should it be deemed necessary that flocculant is needed to increase the rate of settlement, NLDOEC will be consulted prior to use;
- vii) To maintain operating capacity, removal and disposal of accumulated sediment from settling ponds is necessary; and
- viii) When no longer required, settling ponds will be filled in and stabilized and impermeable liners such as plastic will be removed and disposed of in an appropriate manner. This material will be disposed of at the Robin Hood Bay Facility. Unless the material can be re-used, the company will be charged a disposal fee and a commercial permit is required for trucks to enter the facility

2.15.3.4 Ditches

The purpose of ditches is to collect and retain runoff from roads, slopes and development sites (Gosse et al., 1998). Ditching along roadsides enables drainage of the roadbed and corrects for the following deficiencies: water ponding on the roadway, erosion and non-conformity in line, grade or cross section (Gosse et al., 1998). Interceptor ditches are utilized as temporary or permanent structures to intercept and transport clean surface runoff away from erodible slopes, thus limiting the amount of runoff requiring treatment and reducing the potential for surface erosion (Gosse et al., 1998). Ditches will also be used to collect sediment-laden runoff from slopes for transport to settling ponds or treatment areas (Gosse et al., 1998). To prevent erosion

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and sedimentation, interceptor ditches will be excavated and stabilized. Ditches and especially newly constructed ditches, have the ability to transport high volumes of sediment (Gosse et al., 1998).

The following guidelines have been designed to ensure ditches are utilized effectively (Gosse et al., 1998):

- i) Ditches will not discharge open-ended into a water body and thus will be stabilized. To allow the trapping of sediment before entry of runoff, ditches will be directed to flow into vegetated areas which are situated upslope of water bodies;
- ii) Following a review of the existing or planned drainage, site topography and subgrade conditions, determination of the location of and access to ditches will be made;
- iii) Ditches will be constructed during initial site clearing and laid out following site contours;
- iv) To intercept seepage and runoff in side hills or similar areas, ditches will be installed on uphill sides of the road;
- v) Ditches will be immediately lined with non-erodible material in areas where ditches have been excavated or where soils are erosion-prone;
- vi) In combination with culverts, take-off ditches will be utilized to transport water away from the road and into surrounding vegetation where sediment has the potential to be filtered;
- vii) To control erosion, prevent sedimentation of water bodies and to reduce water velocity in the ditch, road side ditches with long slopes will also require rock check dams, in addition to take off ditches;
- viii) Settling ponds will be utilized to prevent sedimentation and trap sediment if the natural topography of the site does not permit the construction of take-off ditches;
- ix) When no longer required, temporary ditches will be filled and vegetated, if required to re-establish natural drainage patterns; and
- x) Regular maintenance is required to ensure ditches are in good working order. As previously stated, sediment will be removed and structures will be regularly adjusted or repaired, with additional stabilization potentially necessary. All ditch structures will also be inspected by the on-site EM after heavy rainfall or during periods of excessive precipitation.

2.15.3.5 Straw Barriers/Bale Structures

Straw barriers/bale structures are utilized to inhibit the migration of erodible soils and will be installed in runoff paths and other possible areas of concentrated flow (Gosse et al., 1998). These structures are most effective at controlling sediment close to the source while the number of structures needed and their spacing depends upon the nature of construction operations (Gosse et al., 1998).

The following guidelines have been designed to ensure ditches are utilized effectively (Gosse et al., 1998):

- i) Straw barriers/bales will not be utilized in natural water bodies;
- ii) These structures are most effective at treating runoff from very small drainage areas, typically less than 1 hectare, and will be utilized as short-term measures;
- iii) During construction of other erosion control measures previously mentioned, straw barriers/bales will be utilized in shallow ditches or along the side of waterways or property boundaries;
- iv) To ensure stability, these structures will be staked into the ground;
- v) The maximum life expectancy of these structures is approximately 3 months in terms of effectiveness and can be considerably less under successive storms and wetter conditions; and
- vi) To prevent entry into the aquatic environment, any and all accumulated sediment shall be removed regularly by Construction Contractors and disposed of at the Robin Hood Bay Facility.

2.15.3.6 Stream Bank Stabilization

Ensuring the proper stabilization of stream banks is a very important component of protecting against both erosion and sedimentation. When exposed to, or disturbed by, construction activities, stream banks are easily erodible due to the variety of materials they are composed of (ie; sand, soil and gravel) (Gosse et al., 1998). As such, the erosion of stream banks can cause the deposition of high volumes of sediment into the freshwater environment (Gosse et al., 1998). In a natural site, the stability of stream banks is maintained through the living network of vegetation and roots (Gosse et al., 1998). To ensure that bank slopes resist erosion and are stable, all disturbed areas require additional stabilization measures (Gosse et al., 1998).

Stream banks will be stabilized or re-built as soon as possible following disturbance events and will be shaped such that they conform to the existing topography (Gosse et

al., 1998). Stabilization materials will be placed outside the wetted perimeter of the stream, from the toe of the bank slope to a stream bank height equal to the anticipated high water level (Gosse et al., 1998). Stabilization effectiveness will be increased by vegetation planting such as small shrubs, grasses or brushmats (Gosse et al., 1998). Two main stream bank stabilization measures that will be applied will include use of rip rap and geotextiles.

2.15.3.7 Rip Rap

Rip rap composed of logs and rocks are typically used to stabilize eroding stream banks (Gosse et al., 1998). However, these structures will only be utilized in circumstances where vegetation cannot be used to provide adequate support (Gosse et al., 1998). The type of material used for rip rap is dependent on availability of materials present and the individual situation they are used for (Gosse et al., 1998).

The following guidelines have been designed to ensure rip rap is utilized effectively (Gosse et al., 1998):

- i) In terms of size, rip rap will be of a block, angular shape in comparison to elongated or round;
- ii) Rip rap will be composed of a mixed gradation to ensure that smaller stones fill the gaps between larger ones in order to provide stability and compaction. Depending upon the size of the protective rip rap and the type of underlying soil, a layer of filter stones will be used if required;
- iii) Rip rap stone sizes differ based on various stream flow velocities:
 - Mean stone diameter of 200-460mm for a stream flow of less than 3.0 m/s;
 - Mean stone diameter of 200-770mm for a stream flow of 3.0-4.0 m/s, and;
 - Mean stone diameter of 500-1220mm for a stream flow of 4.0-4.60 m/s.
- iv) For banks exceeding a height of 3 m with a grade of more than 2:1, rock rip rap will not be used;
- v) To resist displacement during peak flood events, all rock rip rap will be of sufficient size and be clean and free of fine materials; and
- vi) Where a bank requiring stabilization does not exceed a height of 1 m, with light to moderate flow and a low to moderate gradient, log rip rap will be utilized in streams.

2.15.3.8 Geotextiles

Geotextiles are another stream bank stabilization method utilized to help prevent against sedimentation caused by erosion. They are defined as permeable fabrics which, when used in association with soil, have the ability to separate, filter, reinforce, protect and drain (Gosse et al., 1998).

The following guidelines have been designed so geotextiles are utilized effectively (Gosse et al., 1998):

- i) To be stabilized, geotextiles will be laid by running up and down or across the slope with adjacent rolls of geotextile being overlapped, to a minimum of 300 mm;
- ii) To secure geotextiles on steep slopes, pins will be used if required;
- iii) To repair rips or tears in geotextiles, a new piece of geotextile will be placed over the torn area. This new piece of geotextile will extend a minimum of 1 m beyond the rip or tear; and
- iv) For geotextile installation, consideration will be given to ensure that the materials are either laid or rolled into place instead of being dragged. Dragging geotextiles has the potential to decrease filter properties as exposed soils can smear the material.

2.16 Storage, Handling and Transfer of Fuel and Other Hazardous Material

2.16.1 Potential Environmental Concerns

The potential negative impact of the storage, handling and transfer of fuel and other hazardous material is the possibility of an uncontrolled release to the environment through spillage. This has the potential to have effects on both aquatic and terrestrial species and habitat, groundwater quality, soil and human health and safety. The fuel storage area for the Big Triangle Pond Site is presented on Figure 1.3. It should be noted that only minor temporary containment of fuel drums and small quantities of hazardous materials such as cans, drums and other containers with a volume less than 20 liters, is anticipated on site.

Spillage has the potential result in a variety of hazardous substances being released from a site. Some examples of these substances are listed below:

- i) Waste petroleum products (for example: used engine oil);

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- ii) Oil, lubricants and petroleum;
- iii) Glycol (for example: antifreeze);
- iv) Corrosives (for example: battery acid);
- v) Chlorinated and non-chlorinated solvents (for example: cleaner-degreasers);
- vi) Flammable gases (for example: acetylene);
- vii) Paints;
- viii) Epoxies;
- ix) Propane;
- x) Oxygen; and
- xi) Wood treatments.

2.16.2 Environmental Protection Procedures

Practices to employ to lessen the potential environmental impacts from the storage, handling and transfer of fuel and other hazardous material include the following:

- i) All handling and storage of hazardous materials shall comply with the *Workplace Hazardous Materials Information System (WHMIS) Regulations* under the *OH&S Act*. Material Safety Data Sheets (MSDS) will be available at the Project Site, located at the equipment laydown area;
- ii) Releases of any kind (e.g., water, silt, gases, fluids, fuels, etc.) must be reported to the EM immediately. For further information on spill management and reporting refer to Section 3.6.
- iii) Any spill in excess of 70 litres must be reported immediately by the EM or the HSE Manager who will contact Service NL's 24-hour Spill Report Line (709-772-2083) or (1-800-563-9089).
- iv) Under the *Fisheries Act* Section 38.4, deposition of any deleterious substance, regardless of size, that may enter the freshwater environment (from roadways, ditches or other places), must be reported to an inspector or a fisheries officer as designated under the Act.
- v) In the event of a transportation emergency involving dangerous goods the HSE Manager will contact the Canadian Transport Emergency Centre, operated by the TDG Directorate, at 613-996-6666 or *666 on a cell phone.

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- vi) Any storage system containing fuels will comply and be registered (if applicable, although only temporary storage of fuel drums is anticipated) with the *Storage and Handling of Gasoline and Associated Products Regulations, 2003*.
- vii) Fuel and other hazardous materials will only be handled by workers who are trained and qualified;
- viii) Fire response materials shall be kept at the equipment laydown and fuel storage area and near active exploration sites as needed;
- ix) Soils contaminated by petroleum hydrocarbons will be managed and assessed in compliance with the provincial *Environmental Protection Act*;
- x) As per section 18 of the *Storage and Handling of Gasoline and Associated Products Regulations*, all storage tank systems are required to be inspected by an operator on a regular basis, requiring dipping or gauging and proper maintenance of reconciliation records for two years;
- xi) Within 10 m of the fuel storage area, smoking is prohibited;
- xii) Compliance is required with provincial and federal transport regulations for the transportation of hazardous and dangerous materials; refer also to Section 3.6;
- xiii) Within 100 m of any water body, fueling or serving of mobile equipment is not allowed; this shall be facilitated only in designated areas;
- xiv) Operators are required to attend the entire length of refueling operations;
- xv) Drums shall not be stored within 100 m of any water body;
- xvi) To prevent leakage or spillage, drums containing hydrocarbons and other hazardous materials must be handled, stored, transported and disposed of in an appropriate manner;
- xvii) To protect against rust and corrosion, drums must be tightly sealed as well as surrounded by an impermeable barrier. They shall also be stored in areas which are dry, with an impermeable floor or shall also be stored outside, but only if it has appropriate spill containment (110%) and is covered;
- xviii) Substances from spill containment devices will be stored in a secured area, then disposed of in accordance with applicable legislation;
- xix) Small quantities of hazardous materials such as cans, drums and other containers under a 20 liter volume will be stored in a secure location protected from weather, freezing and vehicle traffic; and
- xx) Any lubricant, waste oil or other used oil must be contained in a closed container or tank and then its disposal must comply with the *Used Oil Control Regulations*.

Section 3.0 CONTINGENCY PLANS

3.1 Introduction

In terms of environmental protection, it is necessary to have contingency plans in place in case any extreme or unanticipated circumstances present. The most common contingency plans adopted by the mineral exploration industry are: dangerous wildlife encounters, the possibility of forest fire events, extreme weather events, the discovery of historic resources, and the potential for hazardous waste, fuel and material spills.

The overall goals of any contingency plan include minimizing the following:

- i) Danger to persons;
- ii) Pollution to watercourses;
- iii) Areas affected by an incident;
- iv) Degree of disturbance to the area and watercourses during clean-up; and
- v) Degree of disturbance to wildlife.

In the case of any emergency situations or environmental incidents, a list of contacts and associated phone numbers is provided in Appendix G.

3.2 Wildlife Encounters

3.2.1 Potential Environmental Concerns

The most substantial concern regarding wildlife is the potential interaction between wildlife and site personnel. These types of encounters pose a risk of stress or injury both to the wildlife as well as workers in the area. Activities associated with construction and mineral exploration has the potential to result in significant damage to endangered or rare species either directly or indirectly through habitat loss.

3.2.2 Response Actions

Following, chasing, diverting, catching or harassing wildlife will not be permitted either by foot or vehicle by any worker at the Project Site;

- i) Garbage and food scraps shall always be cleaned up at both working and site areas so as to avoid attracting wildlife. All domestic waste shall be disposed of at the Robin Hood Bay Landfill Site.
- ii) Disposal containers shall be animal-proof;

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- iii) All vehicles and equipment must yield the ROW to wildlife;
- iv) The HSE Manager must be notified and will be responsible for action when animals are identified in the area;
- v) Wild or domesticated pets are not permitted on site;
- vi) Activities such as trapping, angling and hunting shall be banned on site to avoid increased pressure on both wildlife and fish populations. Firearms shall also be prohibited while on-site;
- vii) Personnel at the site shall be cognizant of the potential for wildlife encounters and must immediately report any sightings to the HSE Manager, who will then notify a representative of the Wildlife Division of the NLDOEC;
- viii) Discovery of an active bird nest on site must be immediately reported to the HSE Manager, resulting in a decision on appropriate action, depending on the species, construction activities as well as status of nesting. Protection zones will be established in the case of endangered or rare species until the nesting cycle is completed. Further details are available in the Avifauna EEMP in Section 4.1;
- ix) Any event that results in either the killing or displacement of any wildlife shall be immediately reported to the HSE Manager. It will be the responsibility of the HSE Manager to contact the Canadian Wildlife Service of Environment Canada at 1-800-668-6767 immediately. Details about the incident along with the contact information of any who were involved must also be communicated with the Construction Supervisor;
- x) Only under appropriate supervision, the movement and release of any animal is the sole responsibility of the NLDOEC under provincial wildlife regulations; and
- xi) In certain circumstances, a research permit will be acquired from the Wildlife Division of the NLDOEC regarding the relocation of nuisance animals.

3.3 Forest Fires

3.3.1 Potential Environmental Concerns

Project activities have the potential to result in forest fires. Potential negative environmental impacts of forest fires include damage to air quality, vegetation, wildlife and human health and safety. Some additional negative impacts include wetland habitat loss, terrestrial habitat alteration and direct mortality of wildlife. As a consequence of fire-fighting, chemicals used also have the potential to be accidentally spilled and released into freshwater environments and thus negatively impact upon biota and their habitat if they persist in nature.

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3.3.2 Response Actions

- i) Immediate steps must be taken to extinguish or contain a fire by the company or Construction Contractors;
- ii) All flammable waste shall be disposed of on a regular basis;
- iii) Any material that is flammable must be stored and handled properly;
- iv) Smoking is only allowed in designated areas;
- v) As recommended by the Forestry Services Branch of NLDNR, there shall be sufficient fire-fighting equipment in proper operating conditions that is suited to the site's location and labor force;
- vi) All personnel must be trained in the use of fire-fighting equipment, which will be enforced by the Construction Contractors;
- vii) During the forest fire season, an operating permit is required from the NLDNR;
- viii) If a particular area is remote in nature, equipment such as mobile phones or radios shall be provided to facilitate communication during emergencies.
- ix) As specified in the forest fire regulations and operating permit, equipment such as back tank, axes and shovels shall be provided;
- x) All ATVs must carry a fire extinguisher during the fire season which is equipped with a minimum of 227 grams of ABC dry chemical. For other equipment and machinery, their fire extinguishers shall contain a minimum of 4.5 kg of ABC dry chemical;
- xi) All fire pumps must be approved by forest services and approvals must also be documented, both of which are the responsibility of the contractor;
- xii) A fully functional fire pump such as the Wajax Mk3 must be available at the site if the number of employees reaches approximately 20 or more. Necessary pump accessories include: a hose strangler, a gated "Y" valve and 2 nozzles for each unit. As well, for each unit, 610 m of forest fire hose must be available. Two of these systems are required if there are greater than 40 employees present at the site;
- xiii) Deviations from equipment requirements shall be made by the forestry official issuing the operating permit in situations where local operating conditions warrant deviations;
- xiv) The forestry official issuing the permit shall designate the area where the forest fire suppression equipment is located in relation to the operating site;

- xv) The operating permit must be shown if requested by a forestry official and a copy of it must remain at the Project Site at all times; and
- xvi) If the weather index for a proposed location rises to either high or extreme, a forestry official will temporarily suspend the operating permit.

3.4 Extreme Weather Events

3.4.1 Potential Environmental Concerns

The occurrence of extreme weather events is also a potential situation which requires a contingency plan to be in place. Severe winter storms are especially dangerous due to strong winds, heavy snow and ice as well as freezing rain. Extreme weather storms have the potential to negatively impact environmental protection structures such as silt fences and damage or disrupt unsecured construction materials. Excessive accumulations of rain have the potential to cause holding ponds to overtop as well.

3.4.2 Response Actions

- i) If there are settling ponds present, their levels will be reduced to allow sufficient room for expected precipitation;
- ii) Secure any containers, loose materials and coverings;
- iii) Clear debris from catch basins, culverts and inlets on a regular basis;
- iv) Ensure waste material is collected and placed in appropriate containers with secured covers. Also make sure to clean any debris out of drainage channels;
- v) Remove and collect any free product resulting from dyked pads or drip pans;
- vi) After clearing out snow or ice and draining down any clean water, be sure to close any drainage valves in storage tank dykes; and
- vii) Ensure that all structures to reduce or eliminate sedimentation are functional, secure and ready to handle an increase in flow.

3.5 Discovery of Historic Resources

3.5.1 Potential Environmental Concerns

The pertinent concern regarding the discovery of historic resources during construction activities is evidently the potential disturbance of archaeological and heritage resources such as tools, pottery, structures, fossils, animal bones and graves. These items are

representative of valuable cultural resources and thus their potential destruction will damage both the resources and the information represented by them.

3.5.2 Response Actions

- i) Suspension of work in the immediate area will be facilitated followed by the notification of the Construction Supervisor and the HSE Manager;
- ii) Within 50 m of a discovery, all work must cease;
- iii) The HSE Manager will notify the provincial Department of Business, Tourism, Culture and Rural Development, Provincial Archaeology Office (PAO) of any discoveries;
- iv) Information to be communicated with the PAO includes the following:
 - Nature of the find;
 - Any extenuating circumstances;
 - Precise and exact map location and time discovered;
 - Site description, such as landmarks and topography;
 - The identity of the person who made the discovery;
 - Current location of the material or if moved, any initiated protective measures for the site and the material;
 - How and by what activity was the material found;
 - Any action undertaken to protect the archaeological feature; and
 - Archaeological site description, including features such as size or visible details, and if possible, photograph or sketch.
- v) Consultation with the PAO will determine an appropriate buffer zone for site areas to be flagged for protection and avoidance;
- vi) Highlight the visible boundaries of the site. Any artifacts or associated materials are not to be moved by personnel unless the material integrity is threatened;
- vii) All artifacts and archaeological sites are the property of the Crown and will not be disturbed under the *Historic Resources Act*;
- viii) All reasonable precautions will be taken to prevent personnel from damaging or removing any important sites or objects;
- ix) Under Section 35.1 and 35.2 of the *Historic Resources Act*, persons in contraventions will be held liable for prosecution;
- x) Incident report forms must be filed with the HSE Manager;

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- xi) If the PAO determines that a location is in fact an archaeological deposit, they will direct the company and its contractors regarding further actions; and
- xii) A qualified archaeologist, who will report to the PAO, will perform an archaeological assessment of the resource. Until the archaeologist consults with the PAO, no work at the site will be conducted.

The following response actions are applicable for the discovery of suspected human remains or a burial site:

- i) Work at the site will be immediately suspended, and the Construction Supervisor and HSE Manager must be notified;
- ii) During heavy equipment operations, if remains are found, equipment will not be moved because this has the potential to result in physical evidence being destroyed;
- iii) Flagging tape or other appropriate means will be utilized to secure the site and its heavy equipment by the contractor and suspected remains will be covered with a tarp;
- iv) The local Royal Canadian Mounted Police (RCMP) detachment will be notified; and
- v) The company will contact the PAO to obtain further guidance if the RCMP determines that the remains are associated with a historic burial.

3.6 Fuel and Hazardous Material Spills

3.6.1 Potential Environmental Concerns

The discovery of contaminated or hazardous materials such as fuel evidently have the potential to have significant adverse effects on vegetation, soil, groundwater, surface water, historic resources, wildlife, aquatic organisms as well as to human health and safety.

3.6.2 Response Actions

- i) The leak or spill shall be stopped immediately and the flow contained by the individual who discovers it;
- ii) All work in the area of the spill must stop immediately and personnel shall evacuate to a location upwind of the spill area;

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- iii) Until the appropriate authority has cleared the contaminated area, no personnel will be permitted to enter the spill area without wearing appropriate PPE;
- iv) Implementation of the WHMIS program in compliance with the *Occupational Health and Safety Act (OH&S Act)* and Regulations governed by the Workplace Health, Safety, and Compensation Commission (WHSCC) of Newfoundland and Labrador;
- v) In marine environments, or with a volume of 70 liters or more on land, the HSE Manager must report any leak or spill of fuel to the Service NL Centre 24- hour Spill Report Line (709-772-2083) or (1-800-563-9089), and the following information must be communicated:
 - Source of the leak or spill;
 - Time of the leak or spill (if known);
 - Time of detection of the leak or spill;
 - Phone number and name of the person who reported the incident;
 - Product type leaked or spilled;
 - Product amount leaked or spilled;
 - Whether or not the leak or spill is still occurring;
 - Type of overflow, rupture, incident-collision or other;
 - If the spill has been contained;
 - Wind direction and velocity;
 - Temperature;
 - Soil conditions, terrain and snow cover and depth; and
 - Proximity to water bodies.

The above information will also be recorded on the Spill Report Form presented in Appendix H and retained on site.
- vi) The following factors will be considered in reaching decisions regarding containment and clean-up procedures:
 - Reduce watercourse pollution;
 - Reduce danger to persons;
 - Reduce spill affected area;
 - During clean-up, reduce the degree of disturbance to the location.

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- vii) In consultation with regulating authorities and the HSE Manager, the Construction Supervisor will have the following responsibilities:
- Assess environmental impacts of differing clean-up procedures and current site conditions;
 - Authorize staff on-site to move pumps and prepare 215 liter drums or other appropriate containers for storage;
 - Authorize staff on-site to begin pumping contaminant into drums and to construct containment dykes;
 - As necessary, utilize absorbent;
 - Discard all contaminated debris through either burning of absorbent and cleaning materials or disposal at an approved landfill site; and
 - Ensure the incident does not re-occur by taking all necessary precautions in the future.
- viii) Training shall be provided for any and all employees who are handling or involved with hazardous materials;
- ix) For each piece of fuel-powered equipment, at least 1 spill kit will be maintained and in good condition at all times to mitigate the potential environmental effects of hazardous material or fuel spills and leaks;
- x) Fuel clean-up kits must be stored in weather-proof containers and located on the equipment;
- xi) The absorption capacity of each spill kit shall be no less than 23 liters;
- xii) Spill response caches shall be maintained in good condition in addition to the equipment-dedicated spill kits. They shall be located and accessible within 15 minute travel as well as in the immediate vicinity of all hazardous material and fuel storage areas. A map depicting the location of the spill response caches will be developed as the Project progresses and incorporated into the EPP;
- xiii) A sufficient absorption capacity of 1000 liters of hazardous or fuel liquids is required for each cache; and
- xiv) On site, the storage of fuel, and associated response actions to spills, will be in compliance with appropriate federal and provincial guidelines, regulations and codes.

Section 4.0 ENVIRONMENTAL EFFECTS MONITORING PLANS AND SOCIETAL CONCERNS

The EEMPs presented below have been prepared to meet the needs of the road construction and mineral exploration phases and will evolve throughout any subsequent phases of the Project. These EEMPs have taken into consideration the information from and commitments made in the Environmental Preview Report (EPR); government regulations, regulator permits and approvals; and guidance documents. The EEMPs will be revised as appropriate throughout the Project.

The EEMPs provide practices for monitoring the success of mitigation strategies proposed for the Project. The monitoring allows the EM and HSE Manager to track any noticeable trends in monitoring data, so that action can be taken as early as possible to deter any issues with mitigation. The HSE Manager will ensure that all Project personnel are made aware of the various monitoring programs outlined in the EPP during the initial EPP review and orientation sessions.

The below sections present protection measures, effects monitoring procedures and mitigation measures for Avifauna, Aquatic Species, Woodland Caribou, and Lichen Species of Concern. Additionally, Section 4.5 describes potential societal concerns and actions that have been, and will be taken to mitigate potential conflicts.

4.1 Avifauna

4.1.1 Purpose

The purpose of the EEMP for Avifauna is to outline the measures for monitoring and mitigating potential effects to avifauna for the construction phase of the proposed resource access road and associated mineral exploration activities to be facilitated at the Big Triangle Pond Site.

Details of the Project description are presented in Section 1.5.

4.1.2 Regulatory Compliance

To protect Avifauna species in the immediate vicinity of the proposed resource access road, all site personnel will be in compliance with all applicable legislation administered through the appropriate regulatory agencies.

4.1.2.1 Migratory Birds Convention Act (MBCA) and Migratory Bird Regulations (MBR)

Under federal legislation, The *Migratory Birds Convention Act (MBCA)* was enacted in order to protect and conserve migratory bird species, whether existing as individual birds or populations, along with their nests. This piece of legislation, along with the *Migratory Bird Regulations (MBR)* it encompasses, are administered through Environment Canada by the CWS. The *MBCA* extends extensive coverage to help protect the following categories of avifauna: waterfowl (ie; geese, loons and ducks), songbirds (ie; warblers, sparrows and thrushes), and seabirds (ie; gulls and terns). However, it does not currently constitute eagles, hawks, owls, grouse, ptarmigan, blackbirds or jays.

4.1.2.2 Species at Risk Act (SARA)

Further federal legislation which affords protection to wildlife is the *Species at Risk Act (SARA)* which protects against endangerment, extirpation, extinction as well as protection from human activity. Three schedules exist under SARA, with Schedule 1 describing species which are officially protected and categorized under the following designations:

- i) Special concern: wildlife species which have characteristics that make it especially sensitive;
- ii) Threatened: wildlife species that will likely become endangered if nothing is done to reverse the factors leading to its extirpation or extinction;
- iii) Endangered: wildlife species that is facing imminent extirpation or extinction; and
- iv) Extirpated: wildlife species that no longer exists in the wild in Canada but still exists elsewhere.

SARA's Schedule 1 is the official list of wildlife species at risk in Canada. When a species is officially listed, there are specific measures put in place and implemented to protect and recover the listed species.

4.1.2.3 Newfoundland and Labrador Endangered Species Act (NLESA)

Within the province of Newfoundland and Labrador, to complement the federal *SARA* legislation, wildlife species at risk are protected and managed under the *Newfoundland and Labrador Endangered Species Act (NLESA)*. Based on recommendations from the provincial Species Status Advisory Committee (SSAC) and Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the *NLESA* protects wildlife species, populations or subspecies which are designated as vulnerable, threatened, endangered

or extirpated. NLESA specifically states that it is prohibited to disturb, harass, injure or kill any individual. Under the NLESA, there are currently 14 listed bird species which are afforded protection.

4.1.2.4 Newfoundland and Labrador Guidelines and Standards

The province does not have standards, guidelines or recommendations regarding setback buffer distances (aside from raptors) to prevent disturbance to birds, particularly to other avian groups that fall under provincial jurisdiction. The CWS has prepared bird survey methodologies for a number of bird species that the Province of Newfoundland and Labrador has adopted.

The Wildlife Division of the NLDOEC has indicated that the standard approach taken by other proponents if a nest is identified during a nest search is to apply a 30 m buffer around the nest until the nest has fledged. The Wildlife Division of the NLDOEC also provided draft “Proponent Guidelines and Standards for Ecosystems and Wildlife in Newfoundland and Labrador, Appendix A – Nest Survey Protocols” as a reference for nest search protocols.

4.1.3 Baseline Information for Avifauna within Project Area

The sections below present the baseline information available for Waterfowl, Passerines, Game Birds, and Water Birds, Raptors, and Species of Special Concern, within the Avalon Peninsula.

4.1.3.1 Waterfowl

Within the Avalon Forest Ecoregion, in which the proposed resource access road is located, the most abundant waterfowl species are the American Black Duck (*Anas rupripes*) and Green-winged Teal (*Anas carolinensis*), with Northern Pintail (*Anas acuta*), Ring-necked Duck (*Aythya collaris*) and Common Goldeneye (*Bucephala clangula*) occurring in smaller densities (Goudie, 1987). Relatively high densities have been reported in the the Avalon Forest Ecoregion for Canadian Goose, Ring-necked Duck, American Black Duck and Green-winged Teal as well (Nalcor, 2014). It has been determined that on the Avalon Peninsula, the diversity of waterfowl species is relatively low, however, the area does provide breeding habitat for Great Scaup and the migrating Black and Surf Scoter (Warkentin and Newton, 2009). These species are also only found on the Avalon Peninsula in general (Nalcor, 2014). As depicted below in Table 4.1 other species which have occurrences on the Avalon Peninsula include American Wigeon (*Anas Americana*), Red-breasted Merganser (*Mergus serrator*), Common Merganser (*Mergus merganser*) and Mallard (*Anas platyrhynchos*) (Warkentin and Newton, 2009),

with sightings on the southern part of the Avalon Peninsula of Greater Scaup (Nalcor, 2014). Harlequin Duck (*Histrionicus histrionicus*) is found during the winter moulting and staging in coastal areas such as the Cape St. Mary’s ecological reserve, but does not breed on the Avalon Peninsula (Thomas, 2008). Cape St. Mary’s ecological reserve has also documented a small number of individual ducks in the summer (Thomas, 2008).

Table 4.1 Status of Waterfowl on the Avalon Peninsula

Waterfowl Species on the Avalon Peninsula		
Present	Infrequent	Absent
American Black Duck (<i>Anas rubripes</i>)	American Wigeon (<i>Anas americana</i>)	Long-tailed Duck (<i>Clangula hyemalis</i>)
Canada Goose (<i>Branta canadensis</i>)	Black Scoter (<i>Melanitta Americana</i>)	Northern Shoveler (<i>Anas clypeata</i>)
Common Goldeneye (<i>Bucephala clangula</i>)	Common Merganser (<i>Mergus merganser</i>)	White-winged Scoter (<i>Melanitta fusca</i>)
Common Loon (<i>Gavia immer</i>)	Harlequin Duck (<i>Histrionicus histrionicus</i>)	
Green-winged Teal (<i>Anas carolinensis</i>)	Mallard (<i>Anas platyrhynchos</i>)	
Northern Pintail (<i>Anas acuta</i>)	Red-breasted Merganser (<i>Mergus serrator</i>)	
Ring-necked Duck (<i>Aythya collaris</i>)	Surf Scoter (<i>Melanitta perspicillata</i>)	
Scaup species		

Modified from Nalcor, 2014.

4.1.3.2 Passerines, Game Birds, and Water Birds

22 passerine species, including Rusty Blackbird (*Euphagus carolinus*) and Red Crossbill (*Loxia curvirostra*), have been documented near South Head and along the east coast inland from Gull Island on the Avalon Peninsula (Vassallo and Rice, 1981). The most common species that have been observed on the Avalon Peninsula include: Blackpoll Warbler (*Setophaga striata*), Northern waterthrush (*Parkesia noveboracensis*) and Fox Sparrow (*Passerella iliaca*) (Vassallo and Rice, 1981). Through survey efforts in 2008, it was determined that 25 passerine species exist in the Avalon Forest Ecoregion and 41 species in the surrounding Maritime Barrens Ecoregion (Nalcor, 2014). This survey indicated that the most common species were Blackpoll Warbler, Northern Waterthrush, White-throated Sparrow (*Zonotrichia albicollis*), Yellow-bellied Flycatcher (*Empidonax flaviventris*), American Robin (*Turdus migratorius*) and Yellow-rumped Warbler (*Setophaga coronata*) (Nalcor, 2014). While the known breeding range of the

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Olive-sided Flycatcher (*Contopus cooperi*) includes the Avalon Peninsula, they were not found during 2008 survey efforts (Nalcor, 2014).

Since 2003, 23 observations of Red Crossbill have been reported within the Avalon Peninsula, with relatively more recent sightings near Whitbourne (Nalcor, 2014). This may suggest that successful nesting in this area may be occurring (Nalcor, 2014). 2008 surveys yielded no sightings of Gray-cheeked Thrush (*Catharus minimus*) (Nalcor, 2014). Also in 2008, surveying by Nalcor observed 50 Blackpoll Warbler in the region and field surveys by Stantec identified an additional 8 individuals (Nalcor, 2014). 2008 surveys within the region identified various species of wetland sparrows, including 16 Savannah Sparrow (*Passerculus sandwichensis*), 23 Swamp Sparrow (*Melospiza georgiana*) and 3 Song Sparrow (*Melospiza melodia*) (Nalcor, 2014). While the breeding range of Lincoln's Sparrow (*Melospiza lincolnii*) exists within the region, it was not recorded during 2008 surveys (Warkentin and Newton, 2009). 2008 surveys identified only one observation of Rusty Blackbird but only in the Maritime Barrens Ecoregion while other records indicate it has been identified twice near Whitbourne (Nalcor, 2014). As of yet, Bobolink (*Dolichonyx oryzivorus*) has not been observed within the Avalon Peninsula (Nalcor, 2014)

Upland game birds are defined as non-waterfowl species hunted for subsistence which include species such as ptarmigan, snipes and grouse (Nalcor, 2014). The main upland game species hunted in insular Newfoundland include the following: Rock Ptarmigan (*Lagopus muta*), Willow Ptarmigan (*Lagopus lagopus*), Ruffed Grouse (*Bonasa umbellus*) and Spruce Grouse (*Falci pennis canadensis*); all of these species are considered resident species on the island (Warkentin and Newton, 2009).

The most important colonies of coastal water birds are actually found on the Avalon Peninsula in the area of Conception Bay (Nalcor, 2014). Avifauna in Conception Bay consist mostly of coastal water birds which nest in Arctic and Subarctic regions and are particularly abundant when they migrate to this bay (Nalcor, 2014). To spend the flightless period during the molt of their flight feathers, some pelagic seabirds and coastal water birds (specifically sea duck) gather in some Newfoundland marine waters during the summer (Nalcor, 2014).

On the Avalon Peninsula, in the Conception Bay region, during the nesting season the seabird community consists mostly of coastal water birds which nest either as individual pairs or in small colonies (Nalcor, 2014). Just outside the bay there is also a large colony of pelagic water birds as well (Nalcor, 2014). At the Baccalieu Island Ecological Reserve, colonies of 8 pelagic seabird species exist while Baccalieu Island houses 30,000 Atlantic Puffin (*Fratercula artica*), 12,795 Black-legged Kittiwake (*Rissa tridactyla*), 4000 Common Murre (*Uria aalge*) and 1,712 Northern Gannet (*Morus bassanus*) pairs (Lock,

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Brown and Gerriets, 1994). Along the west shore of Conception Bay, there are also much smaller colonies of kittiwakes, while nesting coastal water birds are abundant and widespread (Nalcor, 2014; Lock et al., 1994).

Along the Newfoundland coast, the most common water bird species is the Common Eider (*Somateria mollissima*) in all seasons and tends to nest in colonies (Lock et al., 1994). They have also been found to nest at Shoal Cove in smaller numbers, as well as off the opposite side of the Northern Peninsula in and around the Hare Bare Ecological Reserve where 93+ pairs have been observed and near the Bell Island South Coast where 30+ pairs have been identified (Nalcor, 2014; Lock et al., 1994). While the preferred foraging location of these species is unknown, it has been determined that during foraging sorties, they are unlikely to cross the Northern Peninsula (Nalcor, 2014). At Cape St. Francis, as many as 5000 Common Eiders were observed to winter and at Grates Point, they have been known to winter in globally significant numbers of up to 12,000 individuals (Nalcor, 2014). Alternatively, along the shores of Bell and Kelly's Islands and along the coast to the east of these islands, estimates suggest up to 0.04 ducks/km winter (Lock et al., 1994). For over 10 years at Spaniard's Bay, observations have been made of one to two Barrow's Goldeneye while occasionally; individual Harlequin Ducks are spotted around Conception Bay in the winter (Nalcor, 2014). Around the coastline of Conception Bay, abundances of Herring, Glaucous, Great Black-backed, Iceland and Black-headed Gulls are distributed in mixed flocks of up to a few hundred during the winter (Nalcor, 2014).

In insular Newfoundland, as determined by the Canadian Wilderness Society's Atlantic Canada Shorebird Survey, shorebirds most commonly stop-over in the following locations: Shoal Cove East, Pines Cove, Eddies Cove East, Anchor Point, Bear Cove, Lower Cove, Shoal Cove West, Deadman's Cove, Sandy Cove as well as L'Anse aux Meadows (Nalcor, 2014), with migrant shorebirds also making stops to Hare Bay (Nalcor, 2014). Within Conception Bay on the Avalon Peninsula, a low abundance of fulmars or shearwaters occasionally enter the outer portion of the bay, however, the bay's marine habitat does not support molting or pre-molting concentrations of seabirds while during the summer, no large concentrations of molting coastal water birds exist (Nalcor, 2014). While it has not been reported that pelagic seabirds winter in Conception Bay, coastal water bird species such as the Great Cormorant (*Phalacrocorax carbo*), Common Loon and various duck species do (Nalcor, 2014). Within the marine waters of Conception Bay during the nesting season, Spotted Sandpiper (*Actitis macularius*) is the only shorebird, however, as it is not colonial, its density is often low (Nalcor, 2014).

4.1.3.3 Raptors

Diurnal raptors that are present in insular Newfoundland include the following: Osprey (*Pandion haliaetus*), Bald Eagle (*Haliaeetus leucocephalus*), Northern Harrier (*Circus cyaneus*), Sharp-shinned Hawk (*Accipiter striatus*), Northern Goshawk (*Accipiter gentilis*), Rough-legged Hawk (*Buteo lagopus*), American Kestrel (*Falco sparverius*), Merlin (*Falco columbaris*) and Gyrfalcon (*Falco rusticolus*) (Warkentin and Newton, 2009; Whitaker, Montevecchi and Gosse, 1996). Most of these listed are widely distributed in Newfoundland where they nest, with Osprey being the most common species (Warkentin and Newton, 2009). The least common species include the Gyrfalcon and American Kestrel, with the Gyrfalcon only occurring in migration and over winter (Warkentin and Newton, 2009).

Owl species that breed in insular Newfoundland include the following: Boreal Owl (*Aegolius funereus*), Great Horned Owl (*Bubo virginianus*), Northern Hawk Owl (*Surnia ulula*) and the Short-eared Owl (*Asio flammeus*) (Warkentin and Newton, 2009). While all of these owl species are found in insular Newfoundland, Northern Hawk Owl is considered relative uncommon as it shows preference for colder, more northern areas (Warkentin and Newton, 2009). In addition to these 4 owl species, the Snowy Owl (*Bubo scandiacus*) can also be found but only in over winter and migration (Warkentin and Newton, 2009).

As previously stated, although the Osprey is the most abundant raptor, nesting habitat in insular Newfoundland is categorized as below-average quality (Nalcor, 2014). A 1998 survey by Nalcor identified only 3 active and inactive Osprey nests on the island (Nalcor, 2014). Surveys in 1998, 1999 and 2008 yielded no indications of any Bald Eagle nests within the province however, they are considered to be year-round residents on the island, found in association with forested areas around lakes and ponds as well as near the coast (Nalcor, 2014; Warkentin and Newton, 2009). High numbers of Bald Eagles were also discovered in parts of both Trinity Bay and Placentia Bay but few nests were found on inland portions of the Avalon Peninsula (Nalcor, 2014). On the Avalon Peninsula, between 2000 and 2005, there were reports of 10 sightings of the Short-eared Owl between January and March, as well as 2 Christmas Bird Count sightings at St. John's and Cape Race (Schmelzer, 2005).

4.1.3.4 Species of Special Concern

No known endangered species are present on the Project Site. However, species of concern which have been noted on the Avalon Peninsula include the following: Red Knot, Common Nighthawk (*Chordeiles minor*), Barrow's Goldeneye and the Ivory Gull (*Pagophila eburnea*) (Nalcor, 2014). On the western end of the Avalon Peninsula, there have been several Red Knot sightings at Bellevue Beach in Trinity Bay, as well as at

Arnold's Cove and Come by Chance (Nalcor, 2014; Garland and Thomas, 2009). The majority of these sightings have been categorized as fall migrants, mostly observed in September and October (Nalcor, 2014).

4.1.4 Mitigation Measures

Eagleridge is committed to the following mitigation measures:

- i) **Avoidance and Mitigation** - During the migratory bird breeding season, vegetation clearing and road construction activities will be avoided, where possible;
- ii) **Personnel Awareness** - Educate personnel in understanding their legal obligations to prevent effects to avifauna and ensure tools to identify potential nest sites are made available; and
- iii) **Focused Survey Protocols** – Protocols made available to determine the presence of avifauna in specific locations to locate nests prior to tree clearing and subsequent development.

4.1.4.1 Avoidance and Mitigation

Impacts will be minimized or reduced where avoidance is not possible by following appropriate mitigation measures such as those listed below:

- i) Clearing areas and construction footprint will be minimized, and natural buffers, as outlined in Section 2.5, will be adhered to surrounding wetland and riparian zones;
- ii) Provincial and federal legislation, permits, approval and guidelines will be complied with;
- iii) Vegetation clearing activities during bird breeding season will be avoided wherever and whenever possible;
 - a. Landbirds – May 1 to August 31
 - b. Waterfowl – April 1 to August 31
 - c. Raptors – May 1 to September 15
- iv) Construction activities during bird breeding season will be avoided. Clearing the vegetation the previous winter season will reduce the risk of incidental take on migratory birds that may nest in vegetation, however, some ground-nesting birds may nest in clear-cuts devoid of vegetation, thus the EM or a designated

- specialist (avian biologist) will conduct nest searches prior to construction (post-clearing); and
- v) If clearing cannot be avoided during bird breeding season, nest search protocols as described below will be followed.

4.1.4.1.1 Pre-Clearing Nest Survey Protocol

If clearing cannot be avoided during bird breeding season, pre-clearing nest searches will be facilitated in order to identify and specify locations where migratory birds may be nesting within and in the vicinity of a Project Site. This constitutes within 100 m for waterfowl or water birds and within 30 m for passerines. To meet the requirements of the *NLESA*, the *MBCA*, and the *MBR*, these surveys aim to reduce bird mortality through avoiding the potential destruction of bird nests.

Surveys will be completed within a maximum of 7 days prior to the start of clearing activities, as close to the scheduled clearing date as possible. Surveys will be facilitated by an appropriate number of participants based on the area to be covered through a universally accepted ground search protocol. To assure 100% coverage of the area of interest, three (3) trained professional surveyors, able to identify bird species and nests, and familiar with searching for nests, will each survey line transects of 10 m wide (NLDOEC). The line transects will be completed in the area of interest by 1 km intervals to insure a thorough search (NLDOEC).

All participants responsible for conducting ground searches, if deemed necessary, will be instructed on how to identify nests that are either readily visible or well-concealed. If active nests are not visible, survey members will also be aware of indicative behavioral cues which include: aggressive location defense (against people or other birds), alarm calling or agitated behavior, birds flushing from the ground at close proximity to the observer, birds sitting on nests, pairs observed together (courtship and copulation), singing males, adult birds repeatedly carrying food or nest material to repeated locations, or the presence of recently fledged pairs (indicators are tufts of down feathers remaining or begging persistently for food).

If it is discovered that there is evidence of breeding within the Project Site, setback distance will have to be set up at 30 m for passerines and 100 m for waterfowl or water bird nests.

The following actions is to be taken if an occupied nest is discovered: the EM and HSE Manager will be informed, the bird species will be determined and documented, the GPS (global positioning system) location will be recorded and photographs of the nest

will be taken for documentation as well. However, to avoid any long-term disturbance to the nest, time spent at the location will be reduced as necessary. This type of information can subsequently be utilized to determine appropriate mitigation measures. If it is determined that bird species listed federally or provincially or any incidental wildlife are present, they will be noted and their locations recorded using a GPS unit. Further, applicable buffers and avoidance measures are to be enforced if any occupied nest is discovered where clearing is planned or required. Consultation will be conducted with both the Wildlife Division of the NLDOEC and Environment Canada if any alternative mitigation is to be implemented.

4.1.4.1.2 Nest Monitoring

As described above, in the event that a nest is discovered during pre-clearing nest surveys the location will be logged using a GPS and a buffer established. Nests will be monitored to ensure that clearing and construction activities do not disturb the nesting birds. If the nesting bird appears to be disturbed by on-going activities, the EM will halt clearing and/or construction activities until it is deemed safe to proceed (i.e., behaviour of nesting birds, discussions with government biologists, etc). Signs that the nest may have been disturbed include:

- i) nest-building stops;
- ii) adults flush from the nest; and
- iii) adults fail to return to the nest.

Nest monitoring will discontinue if the nest fails (i.e., the eggs do not hatch within the incubation period), the nest is depredated, or the nest is destroyed by natural causes (high winds, etc.). The area can only be cut when the surveyors confirm that fledging has occurred within the appropriate timeframe for the species in question found at the active nest (NLDOEC).

4.1.4.2 Personnel Awareness

Personnel on site will be trained to be familiar with signs of bird habitation. The EM and HSE Manager will have detailed knowledge and experience in the use of techniques similar to that of the ground survey. Environmental awareness briefings held by the HSE Manager will keep site personnel updated on current site mitigation activities.

If during construction, species at risk are discovered, the HSE Manager will contact the Wildlife Division of the NLDOEC to determine if either the activity will be halted or

appropriate mitigation measures can be facilitated. The CWS will be contacted regarding any questions about migratory birds.

All vehicles and equipment will adhere to the posted construction site speed limits and will yield the right-of-way to wildlife. As per the regulatory requirements set by the NLDTW, speed limits at the Project Site will not exceed 30 km/hr. Vehicles will be able to continue their movement on the proposed resource access road but will be prohibited from stopping within any buffer areas established surrounding a nest found adjacent to the road. Public access to the proposed resource access road will be restricted via a locked gate.

4.1.4.3 Focused Survey Protocols

The following specific focused surveys should be conducted by experienced avian biologists in targeted habitats across the Project Site prior to clearing if deemed necessary.

4.1.4.3.1 Survey Protocol for Raptors

If required, raptor nest surveys will be facilitated to determine the presence of potential nests within the Project vicinity. To record activity before potential nesting failures to allow better viewing of potential nest sites within deciduous vegetation, these surveys are typically facilitated early in the breeding season via helicopter forays. These flights shall comply with standard operating procedures and applicable Safe Work Practices with participants able to communicate using headsets and live microphones within the helicopter. Flights will typically adhere to a pre-determined linear transect line, with coordinates provided to the aircraft pilot before the survey is initiated, which can be uploaded to an onboard global positioning system (GPS) unit for navigation purposes. Standard protocols for flying stipulate that transects should be flown a maximum of 100 m above the tree tops and a minimum height of 50m above the tree top, with a flight speed range of 50 to 80 km/hr (Nalcor, 2014). Surveyors on each side of the aircraft will survey approximately 250 m on their side for 100% coverage. The type of preferential habitat to be surveyed includes the following: shorelines of rivers, lakes, ponds, creeks and other appropriate water bodies, with handheld GPS units to track the flight path. A minimum distance of 200 m must be obtained when a nest is observed and the aircraft must be maneuvered such that potential disturbance to the nest is minimized.

Data to be recorded when a nest is encountered includes the following: digital photograph of nest site, a universal transverse mercator (UTM) position, nesting species (if known), nest tree type, adult presence and behaviour, nest status (occupied

or unoccupied), number of young (if possible to see into nest from helicopter), nest location in tree and general habitat information. A GPS unit will also be used to record nest site characteristics and to conduct back-up data recording, hard copy data sheets, a digital voice recorder and a second GPS unit will be present at all times on board. Where an occupied nest is identified, a potential location of alternate nest sites appropriate for the placement of an artificial nesting platform will be determined and recoded with a GPS unit. If incidental wildlife is encountered, their location will also be geo-referenced and recorded. Further, applicable buffers and avoidance measures will be enforced if any occupied nest is discovered where clearing is planned or required. Consultation is needed with both the Wildlife Division of the NLDOEC and Environment Canada if any alternative mitigation is to be implemented.

4.1.4.3.2 Survey Protocol for Waterfowl

If required, aerial surveys are the best method for surveying waterfowl species. A qualified surveyor is required for ice monitoring in order to identify open water areas which are suitable waterfowl habitat. Survey goals for waterfowl surveys include determining waterfowl species, abundance as well as activity (nest/breeding, staging, foraging). Surveys will be facilitated during the breeding season in late May to early June. Aircraft speeds will be between 50 to 100 km/hr with the helicopter flown approximately 50 to 100 m above ground. To avoid disturbing any waterfowl present, identify the species and maintain safe flying conditions; speed and altitude will vary based on assessment by the surveyors and pilot of the helicopter. As previously mentioned, all surveyors will have the ability to converse via headsets and live microphones and flight routes will be planned beforehand and in accordance with standard operating procedures and applicable safe work practices. A handheld GPS unit will also be utilized to track the flight path. The flight path must follow the edge of open water when approaching.

Within 200 m of the helicopter is the distance used to count waterfowl as beyond this distance the accuracy of identification and detection decreases and when observed, surveyors will record the species, sex and group size. To enable inferences about the breeding population, spring observations will be placed in one of the following categories:

- i) Pair: female and male in close association with each pair representing 1 breeding pair;
- ii) Lone Drake: single isolated drake. Each lone drake is assumed to have a nesting hen and therefore is considered a breeding pair;

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- iii) Grouped Drakes: 2-4 drakes in close association with drakes in smaller groups considered to have been paired on territory, such that they each represent a breeding pair; and
- iv) Other Groups: large groups or containing 5 drakes or more which are generally composed of individuals not dispersed into breeding territories and are considered migrants which are not counted towards the local population.

4.1.5 Reporting

Reporting is a necessary component of EEMPs in order to ensure compliance is being met with all applicable regulations and standards. The following reporting measures will be undertaken:

- i) A detailed log of all nests observed will be maintained including active and inactive nests per breeding season;
- ii) A yearly report will be submitted to the Wildlife Division of the NLDOEC which will summarize all avifauna monitoring activities and include all relevant data collected;
- iii) These reports will entail photographs, a summary of completed activities and any new mapping or data plots of nests; and
- iv) Communication with the Wildlife Division of the NLDOEC will also be facilitated by the HSE Manager regarding any alteration to habitat, timeline or schedule changes, activity changes or monitoring updates.

4.2 Aquatic Species

4.2.1 Purpose

The purpose of the EEMP for Aquatic Species is to outline the protection measures for aquatic species and associated effects monitoring for the construction phase of the proposed resource access road and associated mineral exploration activities to be facilitated at the Big Triangle Pond Site. There are two proposed water crossing locations for the resource access road; Tributary 1 and 2 of Southern Peak Pond are discussed further below.

Details of the Project description are presented in Section 1.5.

4.2.2 Approach

4.2.2.1 Electrofishing

Fish and fish habitat field surveys to collect site-specific information were conducted by GHD biologists on August 4, 5 and 6, 2015. Fish community sampling was completed using a non-lethal approach with a backpack electrofisher by a qualified fisheries biologist. All fish collected were identified, measured for length, weight, and scale samples collected for aging. Scale samples collected were aged by an accredited analytical laboratory for analysis. Surface water sampling was completed concurrently with the electrofishing activities at each of the sampling locations (4 in total).

Sampling locations were approximately 50 m in length with two locations surveyed per tributary and conducted approximately upstream and downstream of the proposed water crossings. Although the original proposal included surveying eight stations, due to the minimal proposed scope of works, limiting the surveys to two locations per tributary was determined adequate for assessing areas with the highest potential of impact of the proposed works.

4.2.2.2 Index Netting

To examine recruitment, mortality and relative abundance, standardized netting surveys were also conducted by the Wildlife Division of the NLDOEC, with the assistance of GHD, in both the Old Sea and Southern Peak Pond between September 2 and September 3, 2015. The program utilized standardized monofilament gill nets with all net gangs containing eight-gill net panels, increasing in mesh size from 1.25 cm to 9.0 cm by 1.25 cm increments. Net panels were attached in series from smallest to largest mesh size and were set at random, perpendicular to the shore, in all locations (3 locations in each lake). By using a standardized complement of mesh sizes, and randomly setting nets, bias due to gear selectivity is consistent and therefore abundance, composition, size and age classes of species are comparable among lakes. Gill net sets extended from the littoral to the pelagic zones. Surface water quality and sediment sampling was completed concurrently with netting surveys.

Care was taken to record the panel size from which an individual fish was removed. Captured fish were collected, identified, enumerated, and measured for fork length (to the nearest mm) and weight (1.0 gm). Sex and maturity were also recorded. An otolith, genetic and scale sample was taken from the majority of the catch. Calcified structures were prepared for age interpretation according to the methods outlined by Casselman

(unpublished). All calcified structures were interpreted for age and growth using the program CSAGES (Calcified Structure Age and Growth Extraction Software). In addition subsets of twenty fish were sampled from each lake for tissue metal analysis. All analytical results will be provided in a subsequent report.

4.2.3 Baseline Information for Aquatic Species within Project Area

In addition to complement the existing baseline information gathered and presented below, an electrofishing re-sampling program will be conducted prior to the installation of the proposed crossing structures. The Wildlife Division of the NLDOEC has approved the following survey methodology for an electrofishing re-sampling program that includes:

- i) Eight sampling stations (two above and below the crossing locations);
- ii) Each station will be block netted and a removal method will be employed to assess what fish species exist within the water courses;
- iii) There will be two stations above and below allowing for replicate trials (replicate trials ensure that the resulting measurements are not just a local anomaly and that the data is an accurate reflection of the aquatic environment); and
- iv) Stations will be selected based on their representation of habitat type.

4.2.3.1 Tributary 1 of Southern Peak Pond

Tributary 1 is a small, meandering coldwater stream that flows north into Southern Peak Pond. The stream banks are steep and vegetated with moderate flow velocities, as indicated by the undercutting noted throughout. The wetted width ranged from approximately 1 to 3 m at the time of the survey. Channel morphology is mainly characterized by riffle-pool-riffle sequences. Substrates consisted mainly of boulder and cobble overlying bedrock with a fine layer of silt in pools. There is minimal instream cover provided by sparse vegetation and moderate overhanging cover provided by riparian tree, shrub and ground.

The stream is located at the bottom of a small valley with a dense stunted coniferous forest to the east and a meadowland to the west. This low-lying area has many hummocks, both wetland and upland vegetation species and varying topography. There is a small wetland to the north of the tributary that is dominated by sedge, rush and

grass species with fine substrate and a large sediment deposition layer of more than 1 m.

4.2.3.2 Tributary 2 of Southern Peak Pond

Tributary 2 is a relatively large, fast-flowing coldwater channel that flows north into Southern Peak Pond. The river banks are relatively steep and highly vegetated with some evidence of erosion (exposed roots, j-trunk trees). The system appears stable with boulders overlying bedrock lining the banks. The wetted width ranged from approximately 12 to 18 m at the time of the survey. Channel morphology is characterized mainly by riffles with some runs and small pools throughout.

The substrates consisted mainly of boulder, cobble and gravel overlying bedrock. Slimes and crusts are present on the hard substrate surfaces with no instream vegetation present within the study reaches. Riparian vegetation, consisting of a coniferous forest, is present above the high water mark and provides minimal overhanging cover.

4.2.3.3 Fishery

Community inventory surveys within the proposed crossing locations of both tributaries of Southern Peak Pond identified two species of fish: Juvenile Brook Trout (*Salvelinus fontinalis*) and Fourspine Stickleback (*Apeltes quadracus*).

Index netting in the Old Sea and Southern Peak Pond identified Brown Trout (*Salmo trutta*), Atlantic Salmon (*Salmo salar*), Brook Trout and evidence of American Eel (*Anguilla rostrata*) (rings of mucosa on individual mesh, eel foraging signs on dead fish).

4.2.4 Regulatory Compliance

None of the species listed as present on the Avalon Peninsula are registered as a species at risk under either SARA or the NLESA. The American Eel is listed as vulnerable under NLESA and a species of concern by COSEWIC. The Atlantic Salmon population on the south coast of Newfoundland is designated as threatened by COSEWIC.

The *Environmental Protection Act* released the Project from EA and set conditions for this release that Eagleridge shall: “... prepare *Environmental Effects Monitoring Plans (EEMs)*, in consultation with the applicable Government divisions, and submit them to the Minister of Environment and Conservation, and receive the Minister’s approval for the EEMs, prior to the start of construction. The EEMs will cover the following valued ecosystem components (VECs) and will be developed to monitor effects as result of the

project and to ensure that any changes to existing baseline as result of project effects are documented and mitigated against: Aquatic ecosystems (including headwaters of Salmonier River) and aquatic species”.

4.2.5 Approvals

NLDOEC, Water Resources Management Division has approved permits for two structures for the Project. An Amendment to Permit to Alter a Body of Water, dated September 8, 2015, approves a 1500 mm x 810 mm corrugated steel pipe arch culvert with concrete footings for the crossing of Tributary 1 of Southern Peak Pond. A Permit to Alter a Body of Water, dated April 23, 2015, further approves a 16 m clear span bailey bridge for the crossing over Tributary 2 of Southern Peak Pond. Both structures will be placed outside of the high water level of each watercourse.

4.2.6 Predicted Project Effects

Since there are no anticipated in-water works required for either of the water crossing locations and both structures will be constructed above the high water level, impacts associated with the construction of the culvert and bridge should be limited to:

- i) Minimal temporary loss of solar inputs and associated vegetation beneath each of the structures for the duration of the Project;
- ii) Localized temporary loss of riparian vegetation along the banks where structures are installed;
- iii) Temporary disturbance to vegetation along the banks during construction; and
- iv) Cleaning and grubbing activities associated with the access road.

As well, the potential exists for typical construction related impacts including erosion and sediment influx, accidental release of hydrocarbons, noise and vibration, and stress or interference with use of habitat or movement, which can generally be managed by implementing standard construction-related mitigation measures.

4.2.7 Environmental Effects Management

4.2.7.1 Mitigation Measures

The mitigation measures outlined below, as well as in Section 2.0 will be properly implemented to prevent or otherwise minimize impacts to fish and fish habitat, in addition to the standard construction-related measures:

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- i) Schedule construction activities in and around waterbodies such that they do not overlap with sensitive life history functions such as spawning. The general construction timing window to protect most species in the area is June 1st to September 30th (i.e., no in-water works between October 1st and May 31st). If there are concerns that construction will take place outside of the timing window, DFO will be contacted to discuss any changes and appropriate mitigation measures;
- ii) Appropriate contingency measures will be in place to address potential changes in water levels, flow velocities, ice conditions etc;
- iii) Permits will be in place for both waterbody crossings;
- iv) The culvert and bridge will both be sized and installed accurately to remain outside/above the high water level of each of the watercourses;
- v) Bank zones will be transitioned smoothly with the up and downstream bank and valley sections.
- vi) If available, when working around or near waterbodies, hydraulic fluids and biodegradable lubricants will be utilized where practical;
- vii) Waterbody crossings will be restricted to a single location and equipment will cross at right angles;
- viii) The number of crossings will be minimized to reduce disturbance within the waterbody;
- ix) Banks and substrates which are not sensitive to erosion shall be chosen, where possible, for all crossings locations, incorporating fording, the bridge and culvert. If it is determined that the bank of the waterbody where the 2 crossings are to occur are erosion prone, the bank will be modified. This would constitute utilizing erosion control techniques such as rip rap or filter fabrics, re-vegetation or directing the natural drainage around the areas of soil;
- x) There will be installation of sediment traps and siltation control structures such as silt fences along with regular maintenance at appropriate locations. To ensure functionality, repairs will be made to any defects or non-functioning structures immediately;
- xi) Prior to each ford, equipment will be inspected to confirm its working order by the Construction Contractors;
- xii) To allow for immediate containment, spill kits and trained personnel will be nearby at all times of construction;

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- xiii) There will be a minimum 100 m distance between any surface water of the associated waterbodies and the storage and handling of fuel and hazardous or controlled products;
- xiv) Any discharge of run-off resulting from construction activities will be in compliance with appropriate regulations as previously stated; and
- xv) During work hours, Eagleridge will enforce a “no-harvesting” of fish policy for all project personnel.

4.2.7.2 Monitoring and Reporting

Reporting is a necessary component of EEMPs in order to ensure compliance is being met with all applicable regulations and standards. The following monitoring and reporting measures will be undertaken:

Within a Month of Road Construction Completion

- i) Water quality sampling at all electrofishing survey locations and water quality and sediment sampling at all netting locations in Southern Peak Pond and Old Sea (3 locations in each lake); and
- ii) A detailed report will be subsequently submitted to the Wildlife Division of the NLDOEC which will summarize all water quality and sediment sampling monitoring activities and include all relevant data collected.

Within a Two Year Period Following Construction Completion of the Stream Crossings

- i) Electrofishing re-sampling program as per the Wildlife Division of the NLDOEC approved survey methodology outlined in Section 4.2.3;
- ii) Water quality sampling at all electrofishing survey locations;
- iii) If there are any water chemistry changes found at the electrofishing survey locations, the lakes will also be sampled following protocols established for baseline information collection; and
- iv) A detailed report will be subsequently submitted to the Wildlife Division of the NLDOEC which will summarize all sampling monitoring activities and include all relevant data collected.

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Water and Sediment Quality Annually

- i) Water quality sampling at all electrofishing survey locations on an annual basis;
- ii) Water quality and sediment sampling at all netting locations in Southern Peak Pond and Old Sea (3 locations in each lake) on an annual basis;
- iii) If there are any water chemistry changes during water quality monitoring, as measured against the baseline water chemistry, fish community monitoring surveys will be conducted to quantify any impacts. The Wildlife Division of the NLDOEC will be consulted to discuss specific monitoring requirements; and
- iv) An annual detailed report will be submitted annually to the Wildlife Division of the NLDOEC which will summarize all water quality and sediment sampling monitoring activities and include all relevant data collected.

Fish Community

There are no set fish community monitoring survey standards for resource access roads associated with mineral exploration activities. However, in addition to the monitoring program outlined, above, in the event of a reportable spill of fuel or hazardous materials, government agencies (DFO, NLDOEC) will be consulted to determine requirements for fish community surveys to monitor and report for potential effects.

At this time, planned mineral exploration activities are very broad and there are no specific planned phases. When the mineral exploration planning begins, details will be provided to the Wildlife Division of the NLDOEC to consult regarding a future fish community sampling event. Eagleridge will also be preparing an Application for Exploration Approval and Notice of Planned Mineral Exploration Work for submission to the NLDNR which will outline the planned exploration activities. In addition, fish community sampling, using the same (Wildlife Division of the NLDOEC) approved survey methodology for lake sampling and electrofishing, will be conducted at a time to be determined in the lifespan of the project. This time will be determined in consultation with the Wildlife Division of the NLDOEC and in consideration of the on-going mineral exploration activities.

If there are any public complaints made to the Wildlife Division of the NLDOEC regarding low catch rates in the area after the road construction completion, Eagleridge will work

with the Wildlife Division of the NLDOEC to address the issue and sampling that may be required to monitor the issue.

4.3 Woodland Caribou

4.3.1 Purpose

The purpose of the EEMP for Woodland Caribou is to outline the protection measures for Woodland Caribou and associated effects monitoring for the construction phase of the proposed resource access road and associated mineral exploration activities to be facilitated at the Big Triangle Pond Site.

Details of the Project description are presented in Section 1.5.

4.3.2 Historical and Baseline Information for Woodland Caribou on the Avalon Peninsula

Woodland Caribou is native to Newfoundland and Labrador, representing the Boreal population which encompasses two distinct groups: sedentary forest-dwelling caribou and migratory forest tundra caribou (NLDOEC, 2009). The sedentary forest-dwelling ecotype is the group in which the Newfoundland population of Woodland Caribou belongs to (NLDOEC, 2009). Instead of migration, sedentary forest-dwelling caribou undergo a seasonal dispersion during calving periods (Nalcor 2014; Bergerud, Luttich and Camps, 2008). The total population of Newfoundland caribou is estimated at approximately 34,000 with a density of 30 caribou/100km² while Labrador is currently estimated at 3 caribou/100 km² (NLDOEC, 2009). In comparison to Labrador's Woodland Caribou herds, insular Newfoundland caribou are not listed as *threatened* under either the federal *SARA* or the provincial *NLESA*, with island caribou occurring at higher densities than similar herds in Labrador (NLDOEC, 2009). Recent surveys have indicated the main reason for their decline to be poor recruitment rates (Nalcor, 2010) and poor calf survival (Trindale, Norman, Mahoney, Weir, Lewis, Porter and Gullage, 2010).

Work on Newfoundland Woodland Caribou (*Rangifer tarandus caribou*) population dynamics previously indicated that the entire population encompassed 4 broadly defined but distinct herds which include: the Interior Head, the Humber River Herd, the Northern Peninsula Herd and the Avalon Peninsula Herd (Wilkerson, 2010). Currently, the government of Newfoundland and Labrador categorizes the Newfoundland Woodland Caribou population into 19 Caribou Management Units (or herds) based on calving locations and for management purposes, as seen below in Figure 4.1 (Wilkerson, 2010).

Figure 4.1 Distribution of Newfoundland Caribou Herds (Wilkerson, 2010)



The hunting season for these caribou herds are from September to December each year, except the following 4 herds are closed for hunting as depicted below in Figure 4.2: The Avalon Peninsula Herd, Burin Knee, Burin Foot and Blow Me Down Mountains (Wilkerson, 2010). Located near the proposed resource access road is the 1070 km² Avalon Wilderness Reserve, which protects the Avalon Peninsula Herd from hunting and habitat loss (Wilkerson, 2010). In the 1960s, the Avalon Peninsula Herd was severely depleted with a steady increase afterwards until a time in the 1990s when they were exposed to Scandinavian Brain Worm and again faced a reduction in population (Wilkerson, 2010).

Figure 4.2 Caribou Management Hunting Areas (NLDOEC, 2009)



In Newfoundland, Woodland Caribou exhibit the following seasonal preferences for food:

- i) Spring: broad-leaved evergreens, deciduous shrubs and sedges (Bergerud, 1972);
- ii) Summer: deciduous shrubs, reindeer lichens and fungi (Bergerud, 1972);
- iii) Fall: reindeer lichen (*Cladonia spp*) (Nalcor, 2014);
- iv) Winter: reindeer lichen (Mayor, Schaefer, Schneider and Mahoney, 2009) and arboreal and evergreen shrubs (Bergerud, 1972).

Population estimates of the Avalon Caribou Herd within Caribou Management Area (CMA) 65 are presented in Table 4.2 below. CMA 65 boundaries are defined in Figure 4.3. These population size estimates were generated using population viability analysis (PVA) and provided by the NLDOEC Wildlife Division. The last census survey completed was in 2005 with an estimate of 570 caribou in the Avalon CMA. As presented in Figures 4.4 and 4.5, caribou observations of groups of 4 and 21 caribou were recorded in 2005, approximately 20 km southeast of the southernmost tip of the proposed resource access road.

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**Table 4.2 Avalon Caribou Management Area Census Survey Data (NLDOEC –
 Wildlife Division, 2015)**

Year	Season	Population Size Estimate
1956	Fall	71
1957	Fall	86
1958	Fall	86
1959	Fall	112
1960	Fall	206
1961	Fall	350
1962	Winter	381
1963	Winter	371
1964	Fall	438
1965	Fall	570
1966	Fall	650
1967	Fall	720
1970	Fall	1230
1971	Winter	1560
1973	Fall	1969
1975	Winter	1537
1976	Spring	1982
1977	Fall	2653
1981	Spring	2422
1982	Winter	1705
1990	Fall	6361
1996	Winter	7104
1998	Winter	1845
2005	Winter	570

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Figure 4.3 Caribou Management Area (CMA) 65

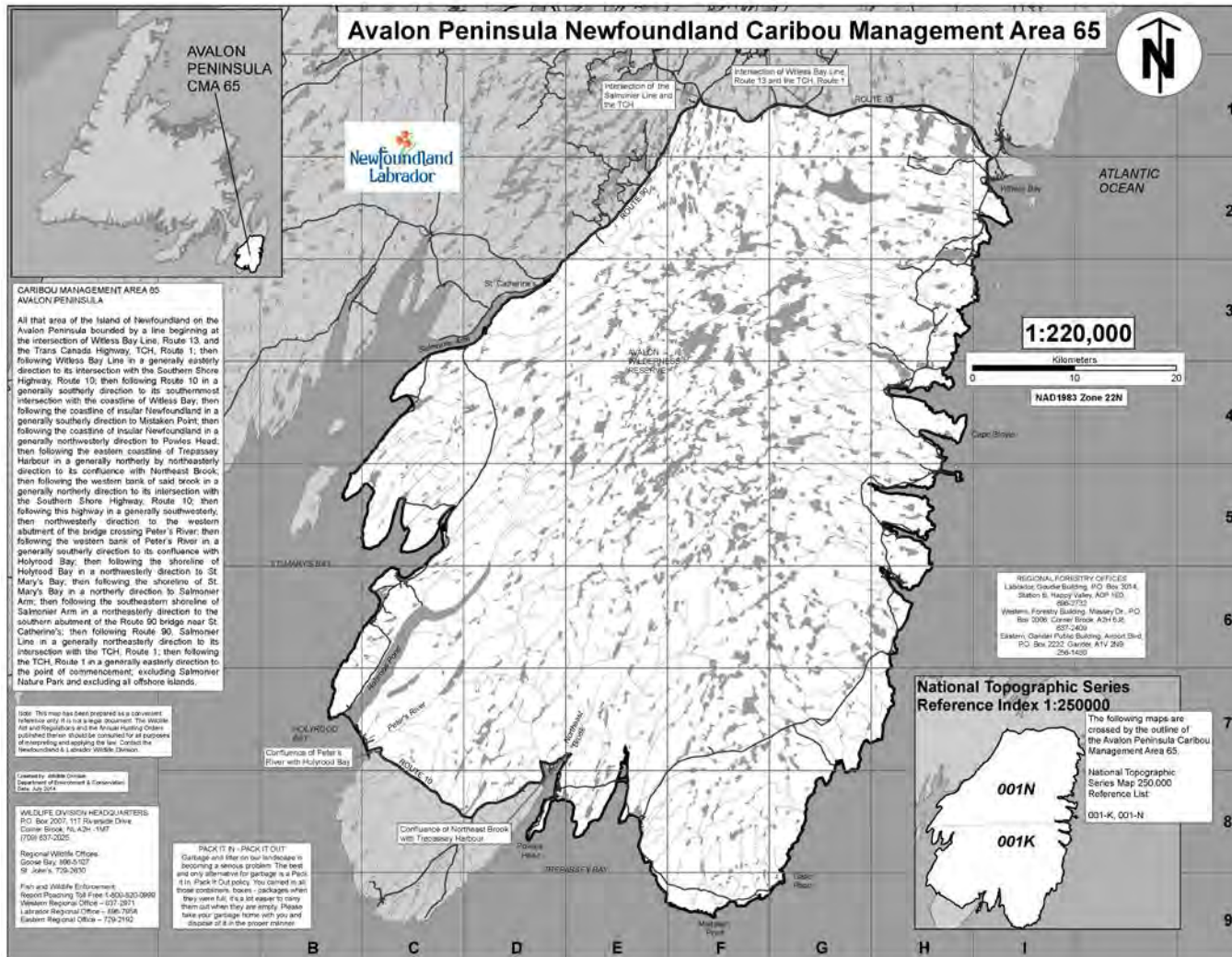
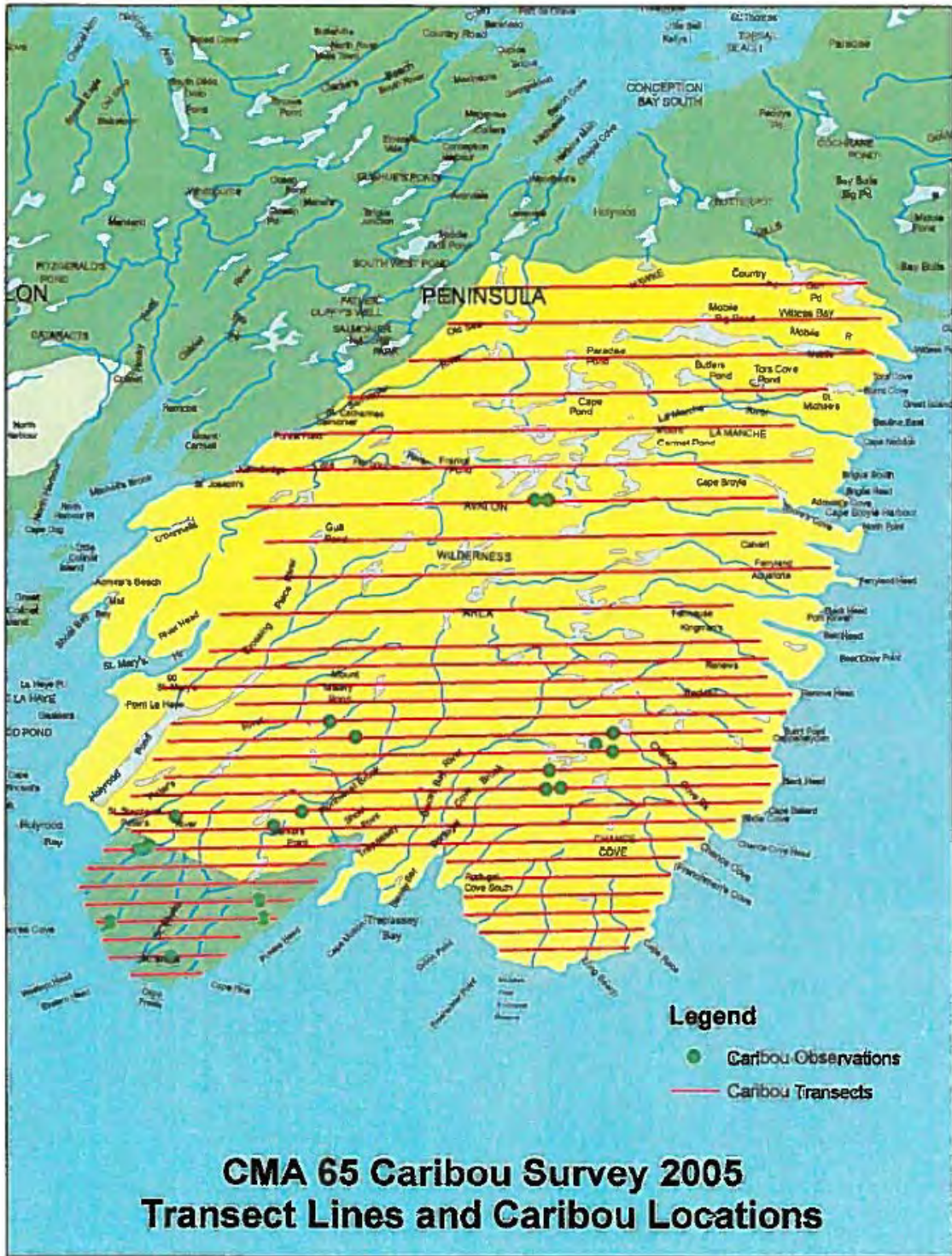
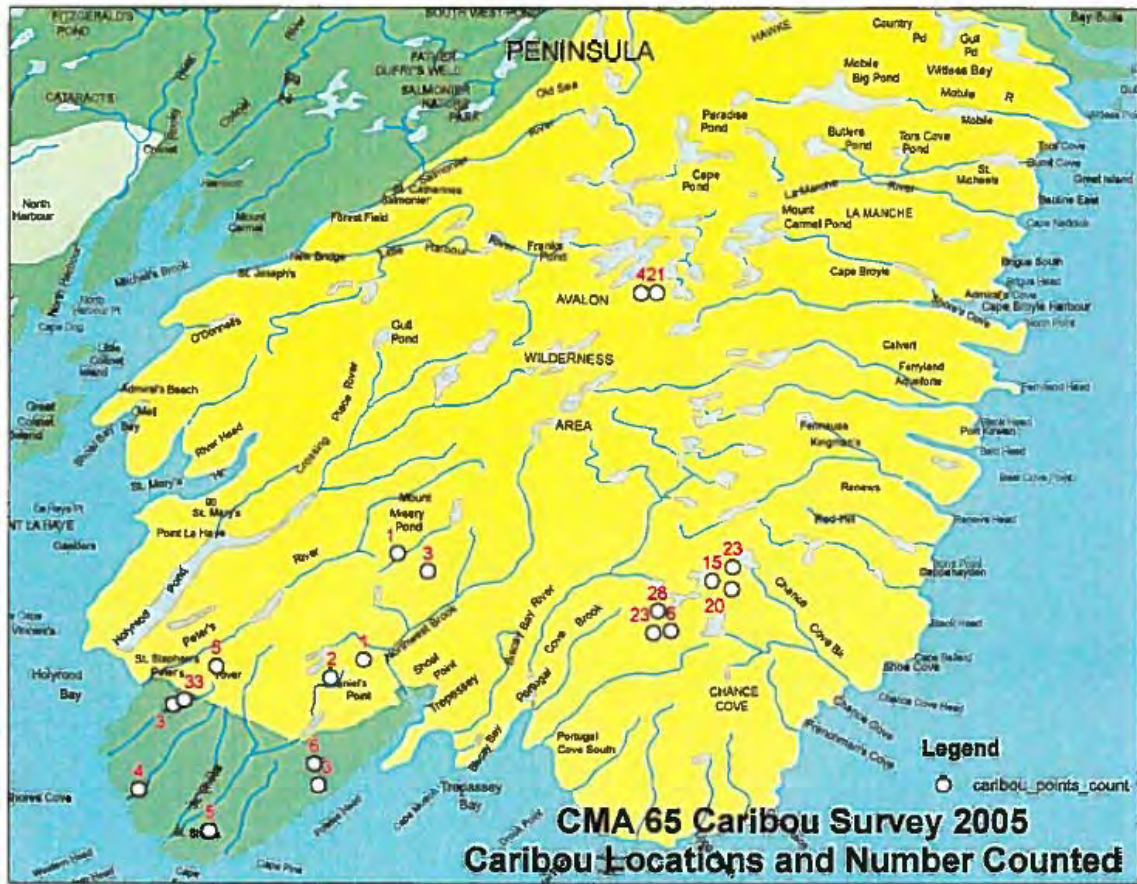


Figure 4.4 CMA 65 Caribou Survey 2005 - Transect Lines and Caribou Locations
(Sourced from NLDOEC, 2015)

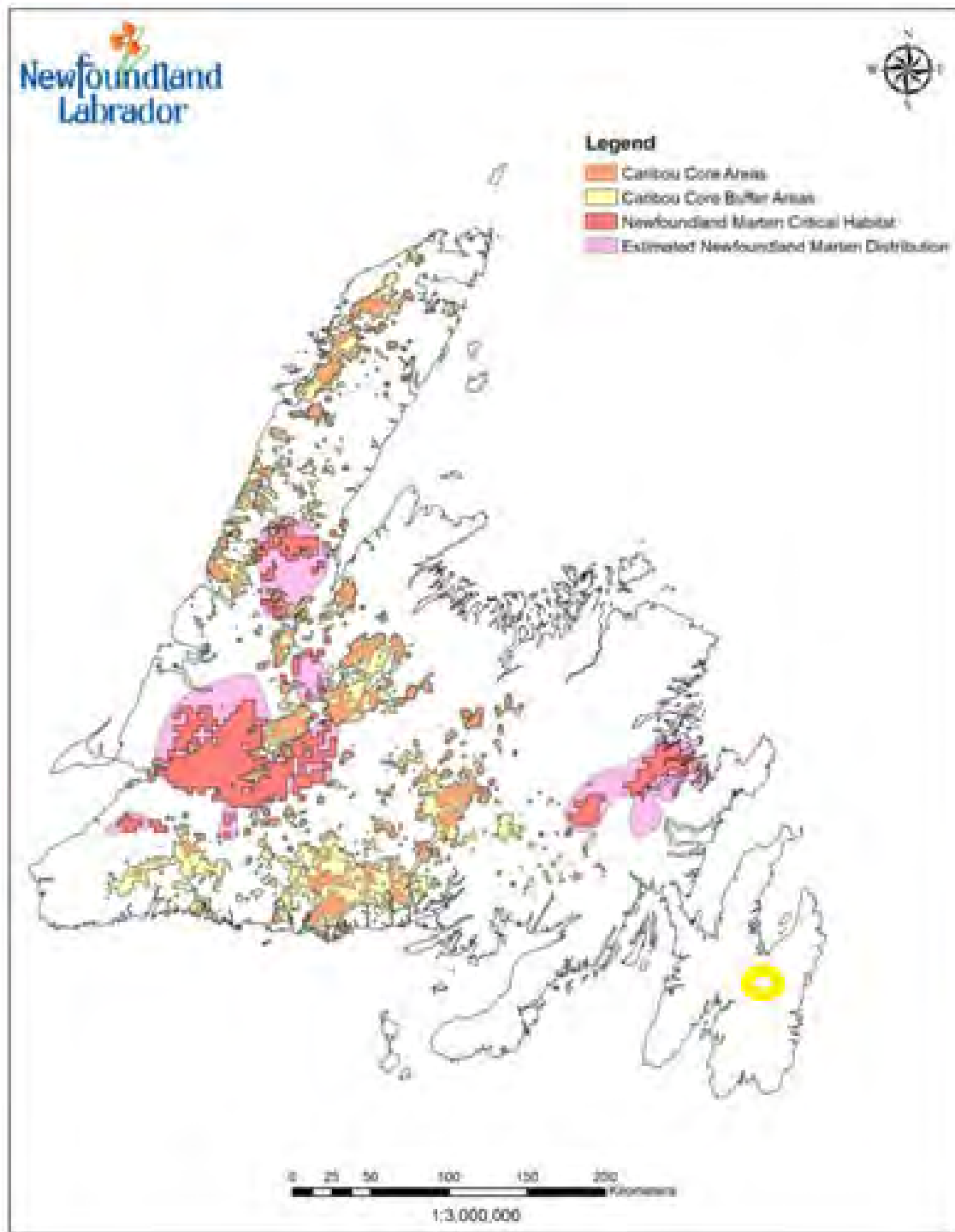


**Figure 4.5 CMA 65 Caribou Survey 2005 - Caribou Locations and Number Counted
 (Sourced from NLDOEC, 2015)**



As can be seen below in Figure 4.6, there are no core caribou areas located within the Project Site (highlighted in yellow) on the Avalon Peninsula. As well, there are no Newfoundland Marten distributions or critical habitat located on the Avalon Peninsula.

Figure 4.6 Woodland Caribou Core Areas in Newfoundland (Modified from Forestry and Agrifoods Agency, 2014)



Several helicopter forays over the entire length of the project that have been conducted have not yielded a single observation of any individual animal nor was there any evidence of any herds in the immediate vicinity. Helicopter surveys were conducted in 2014 on October 29 and 31, and November 1, 5 and 6, and in 2015 on May 29, July 13, 14 and 29, and August 3, 4 and 5.

4.3.3 Regulatory Compliance

The sedentary population of Woodland Caribou in insular Newfoundland is not listed under either the federal *SARA* or *NLESA*. This EEMP's purpose is to evaluate predicted project effects on Woodland Caribou and help to mitigate, to the extent practical, impacts during road construction and exploration activities on:

- i) Caribou mortality; and
- ii) Disturbance to caribou and their associated habitat which includes increased or altered access and habitat loss.

The *Environmental Protection Act* released the Project from EA and set conditions for this release that Eagleridge shall: "... prepare *Environmental Effects Monitoring Plans (EEMs)*, in consultation with the applicable Government divisions, and submit them to the Minister of Environment and Conservation, and receive the Minister's approval for the EEMs, prior to the start of construction. The EEMs will cover the following valued ecosystem components (VECs) and will be developed to monitor effects as result of the project and to ensure that any changes to existing baseline as result of project effects are documented and mitigated against: Woodland Caribou...";

4.3.4 Predicted Adverse Effects

Although there is no evidence of Woodland Caribou currently present in the Project area, it is recognized that historically, populations have been observed there. The following are potential effects of project impacts on possible future Woodland Caribou habitat:

- i) Adverse: Potential habitat alteration and or loss, potential changes in movement or migration routes, temporary sensory disturbances, potential for reduced forage availability or access and potential for direct or indirect mortality through either vehicle collision or increased predation and or hunting;
- ii) Low Magnitude: Potential habitat alteration and or loss;
- iii) Local to Regional Effect: Potential sensory disturbance and avoidance; and,

- iv) Short to far-Future Time Period: Potential avoidance of proposed resource access road and resultant habitat loss.

4.3.5 Environmental Effects Monitoring and Mitigation

Various mitigation tactics will be employed to help lessen impacts on possible Woodland Caribou within the Project area. Site personnel will be trained through orientation, to recognize any vulnerable, threatened or endangered caribou before vegetation clearing and site activities. Personnel will be prohibited from interacting with the caribou; this includes diverting, following, harassing and/or feeding. Garbage will also be contained to prevent attracting caribou to the site.

The Forestry Services Branch of NLDNR will also be notified and updated regarding wildlife encounters and nuisance wildlife. During grubbing activities, to allow for wildlife passage, at every 200 m, a 6.5 m break in slash piles will be made, and they will be stored on alternating sides of the ROW. The maximum height of the piles shall not exceed 3 m.

The EM will report all wildlife sightings and nuisance wildlife to the HSE Manager who will then contact NLDOEC Wildlife Division if deemed necessary. Eagleridge will contact the NLDOEC Wildlife Division if caribou are discovered occupying a location under construction or development to determine if either activities must be suspended or if appropriate mitigation tactics can be facilitated. NLDOEC and the Canadian Wildlife Service of Environment Canada will be contacted immediately at 1-800-668-6767 if human-mediated caribou mortality occurs.

Scheduling will ensure that construction activities will take into account potential impacts to sensitive caribou habitat and critical caribou cycle periods and as a result, will consider additional mitigation tactics needed. Consideration will also be given to annual timing of migration and calving (May 1 to July 1) in the immediate area of the Project Site.

All vehicles and equipment will adhere to the construction site speed limit of 30 km/hr and will yield the right-of-way to wildlife. Public access to the road will be prevented with the installation of a locked gate. In the case of caribou activity on the road, caribou will always have the right of way and be allowed to pass undisturbed. During periods of snow cover, the proposed resource access road will be monitored closely. If caribou approach within 3 km of the road, to facilitate their movement, breaks at 500 m intervals will be created in snow berms.

The overall objectives of the decommissioning procedures outlined in detail in Section 6.0 will ensure that revegetation will be self-sustaining over the long term by being compatible with existing on-site soils. Re-establishment of vegetation and site drainage/surface runoff patterns will facilitate the natural recovery of the area for use by local wildlife. In addition, post-decommissioning of the roadway monitoring will take place to monitor these conditions.

Eagleridge will be in constant contact with the NLDOEC Wildlife Division and other relevant stakeholders and officials during the various Project phases regarding caribou movement and potential sightings in the project vicinity.

This EEMP will constitute both follow-up programs and monitoring programs. Follow-up programs will incorporate either surveys or studies to confirm EA predictions and to determine the effectiveness of the mitigation measures undertaken to help lessen the adverse environmental effects of the Project. Monitoring programs will incorporate either surveys or studies to confirm the Project is implemented as proposed and also to confirm the implementation of all mitigation tactics utilized to help lessen impacts of the Project's potential environmental effects. Compliance monitoring incorporates all environmental monitoring of project activities to confirm compliance with environmental commitments from conditions of the Environment Assessment release and regulatory requirements.

4.3.5.1 Program Protocols

To determine the effectiveness of the EEMP and to decide whether expansion, reduction or deletion of programs is required (with justification), Eagleridge will facilitate follow-up and monitoring programs. This encompasses: baseline data collection, and data collection during construction and exploration activities which are discussed below.

Data collection constitutes metrics that are species specific, relevant, quantifiable, appropriate, repeatable and time-constrained. The purpose of data collection is to collect significant data in an approach that is responsible, focused and defensible and within an appropriate timeline to maintain that mitigation is applicable. A contingency plan would have to be drafted if it is determined that the mitigation was not appropriate.

4.3.5.2 Baseline Data Collection

Where project activities are occurring, baseline data collection is the determination of caribou presence. Prior to construction aerial surveys were conducted which established

the baseline conditions. As noted above, caribou were not observed during the aerial surveys.

4.3.5.3 Construction, Exploration and Decommissioning Activities Data Collection

Aerial surveys will be conducted once per year during the winter throughout all stages of the Project, to observe the presence of caribou in the project vicinity. If caribou are observed during the flight, discussions will be held immediately with the NLDOEC Wildlife Division regarding additional mitigation measures. In addition, a brief report summarizing the aerial surveys including flight tracks/transects and any observations will be submitted to the NLDOEC Wildlife Division annually.

4.3.6 Follow-up and Monitoring

A final follow-up and monitoring report will be written near the completion of construction activities, and subsequently, following exploration and decommissioning activities.

The follow-up section of the report will encompass relevant data about Project interactions with caribou that have been collected throughout the construction period and within the six years of operations (mineral exploration). It will incorporate the following: baseline caribou information, consideration that the data reflects effects collected on caribou interaction during project construction and operations and effects relevant to predicted environmental effects made initially so that there would not be a significant residual impact on Woodland Caribou.

The monitoring section of the report will detail observations from the EM and the mitigation measures utilized regarding the interaction of Project components and caribou activity. This will determine whether the Project was implemented as it was proposed and whether the mitigation measures implemented were effective at minimizing the project's adverse environmental impacts on caribou. This section of the report will also discuss compliance monitoring undertaken by the EM and HSE Manager which were implemented to satisfy regulatory compliance and other commitments outlined as conditions of the EA Release.

4.4 Lichen Species of Concern

4.4.1 Purpose

The purpose of the EEMP for lichen species of concern (SOC) is to outline the protection measures for lichen SOC and associated effects monitoring for the construction phase of

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the proposed resource access road and associated mineral exploration activities to be facilitated at the Big Triangle Pond Site.

Details of the Project description are presented in Section 1.5.

4.4.2 **Baseline Information for Boreal Felt Lichen (*Erioderma pedicellatum*) and Vole Ears Lichen (*Erioderma mollissimum*) on the Avalon Peninsula**

In accordance with the Newfoundland and Labrador *Environmental Assessment Act*, and as a condition of the EA release, Eagleridge has conducted a Boreal Felt Lichen (*Erioderma pedicellatum*) survey in the immediate vicinity of the proposed resource access road for the Big Triangle Pond Project. This survey was conducted to ensure no *Erioderma* thalli exist in the planned route of the proposed access road. *Erioderma pedicellatum* is currently listed under the *NLESA* as vulnerable and endangered under the federal *SARA*. *Erioderma mollissimum* (Vole Ears Lichen) is also listed as endangered under *SARA*.

Details on past survey work conducted near the Project Site and more recent survey work conducted on the Project Site is provided in the Lichen Survey Report located in Appendix I. Survey methods and results are also presented in Appendix I.

During the most recent surveys, five (5) adult thalli of *E. pedicellatum* were discovered at the Big Triangle Pond Project Site. These areas of occurrences can be seen in Figures 5 and 6 of the Lichen Survey Report in Appendix I. All thalli were found on balsam fir, with trees having diameters ranging from 6.5 – 15 cm. All thalli were discovered in relatively wet areas and in close association with the indicator species *Coccocarpia palmicola*. For detailed information on site conditions, refer Appendix A of the Lichen Survey Report located in Appendix I for site data sheets for each *E. pedicellatum* discovery.

4.4.3 **Regulatory Compliance**

To protect identified lichen species of concern in the immediate vicinity of the proposed resource access road, all site personnel will be in compliance with all applicable legislation administered through the appropriate regulatory agencies.

In addition to the above noted requirement for a lichen survey, the *Environmental Protection Act* released the Project from EA and set conditions for this release that Eagleridge shall: "... prepare *Environmental Effects Monitoring Plans (EEMs)*, in consultation with the applicable Government divisions, and submit them to the Minister of Environment and Conservation, and receive the Minister's approval for the EEMs, prior to the start of construction. The EEMs will cover the following valued ecosystem

components (VECs) and will be developed to monitor effects as result of the project and to ensure that any changes to existing baseline as result of project effects are documented and mitigated against: Lichen species (Erioderma pedicellatum, Erioderma mollissimum, and other lichen species of conservation concern)..."

4.4.4 Mitigation, Monitoring and Reporting

Although five (5) adult thalli of *E. pedicellatum* were discovered, each thalli was an approximate distance of at least 20-30 m away from the route of the proposed resource access road. As such, a 30-40 m buffer from the proposed access road will be maintained for each tree bearing *E. pedicellatum* by the EM, under supervision of the HSE Manager. This is consistent with the 5 Year Management Plan outlined by the NLDOEC Wildlife Division.

When construction is taking place near the areas just outside the buffer zones, Construction Contractors will be made aware of the locations and will avoid extending into the buffer zones.

If additional discoveries of Boreal Felt Lichen are made throughout the life of the Project, detailed field data reports as depicted in the Lichen Survey Report located in Appendix I, will be thoroughly completed and submitted to the NLDOEC Wildlife Division. Eagleridge will also consult with the NLDOEC Wildlife Division to determine further mitigation measures, if required.

Eagleridge commits to consulting and complying with the NLDOEC Wildlife Division regarding monitoring procedures for ensuring the protection of Boreal Felt Lichen and other lichen species of concern at the Big Triangle Pond Project Site.

4.5 Societal Concerns

The main societal concern regarding the proposed resource access road and exploration site at Big Triangle Pond is the proximity to cabin owners on the Salmonier Line and within the proposed exploration areas.

The road eliminates accessing the exploration areas via Salmonier Line through cabin owners' properties. However, *any* and *all* exploration activities performed are an approximate distance of at minimum, 1.5 km, extending to 2.5 km away from the location of the cabins on Salmonier Line and shall in no way interfere with day to day living or activities. In addition, the proposed resource access road will be located at an approximate distance of at minimum, 2.5 km, extending to 4.0 km away from any cabins located on the Salmonier Line.

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According to the Crown Lands Division of the NLDMIGA (2015), there are seven (7) registered cabins and four (4) registered ATV trails located within the proposed exploration area (as shown on Figure 1.3). Based on this information, the proposed resource access road will be located at approximate distances ranging from 75 to 965 m from cabins in the area. The proposed road will also cross one registered ATV trail that extends between Split Rock Pond to Old Sea. Use of this ATV trail will not be impeded or obstructed and caution signs will be placed on the ATV trail, on either side of the proposed resource access road. The proposed road will be located approximately 25 to 750 m away from other ATV trails (as shown on Figure 1.3), including a 25 m buffer to be maintained between the ATV trail located towards the southern end of the property and the proposed road.

Exploration activities by Eagleridge and its sister company Vinland Resources Limited, have been conducted in a responsible and environmentally safe way in the Big Triangle Pond area for 25 years. Eagleridge respects the public's right to use and enjoy the natural beauty of this area and will take every precaution to not interfere or disrupt the public's use of this land.

The other three areas of concern which are in proximity to the proposed resource access road at the Big Triangle Pond exploration site are the Hawke Hill Reserve, Salmonier Nature Park and the Avalon Wilderness Area. The proposed resource access road is approximately 3.8 to 4.0 km away from the Hawke Hill Reserve. The St. John's Rod and Gun Club is located between the Big Triangle Pond exploration site and the Hawke Hill Reserve. The proposed resource access road poses no threat or potential disturbance to the Club or the Reserve.

Near the other end of the proposed road is the Salmonier Nature Park, which is approximately 800 m away from the end of the proposed road. No blasting is to be facilitated by Eagleridge throughout the duration of construction or exploration activities. However, should blasting be required at a later date, a Blasting Plan will be developed, and the EPP will be updated in consultation with the NLDOEC. As noted by a condition of release from EA, the Manager of the Salmonier Nature Park (Brenda Pike or Ralph Jarvis), will be contacted at (709) 229-7888 prior to any construction or exploration activities taking place within 5 km of the Salmonier Nature Park.

The Avalon Wilderness Reserve is located a minimum of 3 km away from the proposed road. The beginning of the proposed road is also situated near, as its name suggests, Big Triangle Pond, which is currently crossed by the TCH via a culvert system.

A second condition of release also stipulates that there will be a locked gate installed to restrict public access to the proposed resource access road at all times. This will be

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facilitated through the approval of either the Minister of Transportation and Works if the gate is to be installed inside the TCH ROW or with the approval of the Minister of Environment and Conservation if installed outside the ROW. Determination of the gate location will be made during the road construction process.

Section 5.0 RELEVANT LEGISLATION

The following sections present the applicable legislation to be adhered to throughout the construction and exploration phases of the Project.

5.1 Federal

Table 5.1 below depicts the applicable federal legislation, administering regulatory departments and contact information.

Table 5.1 Federal Legislation and Guidelines and Corresponding Regulatory Departments

Government of Canada		
Regulatory Department	Legislation	Contact Information
Fisheries and Oceans Canada	<ul style="list-style-type: none"> • <i>Fisheries Act</i> • <i>Oceans Act</i> • <i>Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador</i> • <i>DFO Factsheets (Appendix E)</i> 	Tel: (613) 993-0999 or 1-800-465-7735
Environment Canada	<ul style="list-style-type: none"> • <i>Canadian Environmental Assessment Act (CEAA)</i> • <i>Canadian Environmental Protection Act (CEPA)</i> 	Tel: 1-800-668-6767
Fisheries and Oceans Canada and Environment Canada	<ul style="list-style-type: none"> • <i>Species at Risk Act (SARA)</i> 	Tel: 1-800-465-7735 or Tel: 1-800-668-6767
Environment Canada Canadian Wildlife Service	<ul style="list-style-type: none"> • <i>Migratory Birds Convention Act (MBCA)</i> 	Tel: 1-800-668-6767
Transport Canada	<ul style="list-style-type: none"> • <i>Navigable Waters Protection Act (NWPA)</i> • <i>Transportation of Dangerous Goods Act (TDGA)</i> • <i>Transportation of Dangerous Goods Regulations (TDGR)</i> • <i>Canada Shipping Act</i> 	Tel: (613) 990-2309 or 1-866-995-9737

5.2 Provincial

Table 5.2 below depicts the applicable provincial legislation and guidelines, administering regulatory departments and contact information.

Table 5.2 Provincial Legislation and Guidelines and Corresponding Regulatory Departments

Government of Newfoundland and Labrador		
Regulatory Department	Legislation	Contact Information
Environment and Conservation	<ul style="list-style-type: none"> • <i>Environmental Assessment Act</i> • <i>Environmental Protection Act</i> • <i>Storage and Handling of Gasoline and Associated Products Regulations</i> • <i>Used Oil Control Regulations</i> • <i>Environmental Code for Practices for Aboveground Storage Tank System Containing Petroleum Products</i> • <i>Endangered Species Act</i> • <i>Water Resources Act</i> • <i>Environmental Control Water and Sewer Regulations, 2003</i> • <i>Environmental Guidelines for Bridges</i> • <i>Environmental Guidelines for Stream Crossings by All-Terrain Vehicles</i> • <i>Environmental Guidelines for the Fording of any Watercourse</i> • <i>Environmental Guidelines for Culverts</i> • <i>Wildlife Act</i> 	Tel: (709) 729-2664

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Natural Resources	<ul style="list-style-type: none"> • <i>Forestry Act</i> • <i>Cutting of Timber Regulations</i> • <i>Forest Fire Regulations</i> • <i>Environmental Guidelines for Ecologically Based Forest Resource Management</i> • <i>Quarry Materials Act</i> • <i>Quarry Materials Regulations</i> • <i>Mineral Act</i> • <i>Mineral Regulations</i> 	Tel: (709) 729-3017 and (709) 637-2461
Municipal and Intergovernmental Affairs	<ul style="list-style-type: none"> • <i>Municipalities Act</i> • <i>Lands Act</i> • <i>Urban and Rural Planning Act, 2000</i> 	Tel: (709) 729-5677
Business, Tourism, Culture and Rural Development	<ul style="list-style-type: none"> • <i>Historic Resources Act</i> 	Tel: (709) 729-7000
Service Newfoundland and Labrador	<ul style="list-style-type: none"> • <i>Newfoundland and Labrador Occupational Health and Safety Act (OH&S Act)</i> • <i>Workplace Hazardous Materials Information Safety Regulations</i> • <i>Newfoundland and Labrador Occupational Health and Safety Regulations</i> • <i>Motorized Snow Mobile and All-Terrain Vehicle Act</i> • <i>Motorized Snow Mobile and All-Terrain Vehicle Regulations</i> 	Tel: (709) 729-3699

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Transportation and Works	<ul style="list-style-type: none">• <i>Works Services and Transportation Act</i>• <i>Building near Highways Regulations</i>• <i>Highway Traffic Act</i>• <i>Dangerous Goods Transportation Act</i>• <i>Dangerous Goods Transportation Regulations</i>• <i>The Department of Transportation and Works Specifications Book, 2011</i>	Tel: (709) 729-2300
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Further, in compliance with the *OH&S Act* and its Regulations, the following sections of legislation will be strictly enforced:

- i) s.10: A principal contractor engaged in this project shall ensure, where it is reasonable practicable for him or her to do so, that employers, workers and self-employed persons performing work in respect of that project comply with this Act and its regulations;
- ii) s.374: Where the movement of vehicular traffic constitutes a hazard to workers, effective traffic control shall be provided. Traffic control procedures shall at minimum meet the requirements for the Department of Transportation and Works "Traffic Control Manual for Roadway Work Operations" or procedures established by a municipality that have been approved by the minister and all relevant specifications;
- iii) s.378: Precautions must be made to ensure that any stockpiling of materials is done so that will not endanger the safety of workers;
- iv) s.406 (4): Workers must be protected while working on or near excavations. A worker shall not enter an excavation over 1.22 m without the necessary precautions prescribed by the regulations.

5.3 Municipal

As the Big Triangle Pond mineral exploration resource access road is within the municipal boundaries of the Town of Holyrood, all applicable town bylaws shall be complied with and permits obtained.

5.4 Permits, Approvals and Authorizations

Table 5.3 below summarizes potential permits, approvals and authorizations that may be required for the Project.

Table 5.3 Potential Permits, Approvals and Authorizations

Permit, Approval or Authorization	Issuing Agency
Federal	
<ul style="list-style-type: none"> • Authorization for Harmful Alteration, Disruption or Destruction (HADD) of fish habitat • Request for Project Review (for culvert crossing) • Experimental, Scientific, Educational, or Public Display Licence (for electrofishing) 	Fisheries and Oceans Canada
<ul style="list-style-type: none"> • Assessments/Approvals under the <i>Navigable Waters Protection Act</i> • Notification to Handle or Transport Dangerous Goods • Transportation of Dangerous Goods 	Transport Canada
Provincial	
<ul style="list-style-type: none"> • Release from environmental assessment process 	NLDOEC – Environmental Assessment Division
<ul style="list-style-type: none"> • Approval of Environmental Protection Plan 	NLDOEC – Environmental Assessment Division and other assigned Department Committee Members
<ul style="list-style-type: none"> • License to Occupy 	NLDMIGA – Crown Lands Division
<ul style="list-style-type: none"> • Water Use Licence • Permit to Alter a Body of Water for any work in any body of water (including wetland) that is visible on 1:50,000 scale maps <ul style="list-style-type: none"> ○ Culvert Installation ○ Bridge Installation ○ Fording ○ Infilling, Dredging, Debris Removal ○ Miscellaneous Works in a Freshwater Body (wetland) 	NLDOEC – Water Resources Management Division
<ul style="list-style-type: none"> • Permit to Control Nuisance Animals 	NLDOEC – Wildlife Division
<ul style="list-style-type: none"> • Cutting Permit • Operating Permit to Carry out an Industrial 	NLDNR – Forestry Services Branch

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<ul style="list-style-type: none"> • Operation During Forest Fire Season on Crown Land • Permit to Burn 	
<ul style="list-style-type: none"> • Exploration Approval • Quarry Permit or Lease 	NLDNR – Mines Branch, Mineral Lands Division
<ul style="list-style-type: none"> • Notice of Project (project start) 	Service NL – Occupational Health and Safety Branch
<ul style="list-style-type: none"> • Certificate of Approval for Storage and Handling of Gasoline and Associated Products • Temporary Fuel Cache • Fuel Storage Tank Registrations and Waste Oil Storage • Building Accessibility Registration • National Building Code of Canada Form Approval • Permit for Access off any Highway 	Service NL
Municipal	
<ul style="list-style-type: none"> • Approval for Construction/Use of Water/Sewage Systems • Approval to Erect Signs within a Municipality • Building Permit 	Town of Holyrood

Section 6.0 DECOMMISSIONING AND SITE REHABILITATION

This section presents the plans to decommission and rehabilitate the Site progressively, during road operation for mineral exploration activities, and at road closure, following the end of mineral exploration activities. The plans described herein are based on the road design information and best practice rehabilitation technology and procedures available at the time of writing. The decommissioning and rehabilitation activities outlined below should therefore be considered conceptual and subject to revision or update, based on actual site conditions and progressive rehabilitation results as the Project develops over time.

6.1 Objectives and Scope of the Decommissioning and Rehabilitation Plan

The overall objectives of the Decommissioning and Rehabilitation Plan (DRP) proposed for the Site will include the:

- i) Restoration of the land to as close to natural state as possible;
- ii) Creation of a landscape which is compatible with surrounding terrain and land use;
- iii) Mitigation and control of potential sources of pollution, fire risk and public liability to within levels acceptable to all regulatory agencies; and
- iv) Providing an environment and landscape that is suitable for long term public use.

The DRP will work towards achieving both physical and chemical stability of the entire Project Site based on a progressive rehabilitation approach and EEM programs through all phases of the Project, followed by a comprehensive decommissioning.

6.1.1 Physical Stability

The DRP will address the physical stability aspect of the site components that remain after mineral exploration activities have ceased and following road closure. These components may include construction features associated with the road (drainage diversion channels, small temporary settling ponds, embankments, etc.), temporary buildings and site infrastructure at drill pad locations and the equipment laydown and fuel storage area.

6.1.2 Chemical Stability

To meet the DRP objectives, it is necessary to ensure long term chemical stability of the rehabilitated Site. The EPP and DRP procedures outlined within this document contain

appropriate methods to ensure that drainage and surface runoff from the site meet acceptable water quality standards.

Potential chemical stability issues at the Project Site may include erosion and surface water sedimentation that may degrade water quality.

6.1.3 Natural Aesthetic Requirements

The proposed Project Site is situated within an undeveloped natural landscape typified by rugged physiography with rolling hills and valleys. Visual impact of the road development and mineral exploration activities is an important consideration. The primary objective for rehabilitation strategies is to return the site as close to pre-Project development conditions, as practical, with due consideration to the natural aesthetics and, as such, this principal has formed part of the road development and exploration activities planning.

6.1.4 Revegetation and Wildlife

To achieve overall objectives, the DRP will ensure that revegetation will be self-sustaining over the long term by being compatible with on-site soil and local climatic conditions. Establishment of vegetation will facilitate the natural recovery of the area for use by local wildlife and will be conducted in areas that were vegetated prior to the initiation of the development.

6.1.5 Air Quality

Rehabilitation activities also have the potential to create dust during excavation and earthwork associated with removal, grading and/or stabilization of embankments, and soils. Dust levels will be minimized during these activities through the use of water sprays or coverings, where practical, and in the case of rehabilitation activities will be of short duration.

Following the decommissioning construction activities, only occasional light truck or ATV traffic, related to periodic monitoring activities, will occur on site and are expected to have a negligible impact on local air quality.

6.2 Progressive Rehabilitation

When it is determined that additional exploration drilling will no longer be required at individual drill pad locations, the areas will be rehabilitated by restoring the natural drainage patterns and revegetation of the surface through natural encroachment of local native species as the areas will be less than 1 ha (0.01 km²) (SME, 2008).

After the road construction is completed and small temporary settling ponds and diversion ditches (if utilized) are no longer required for surface runoff treatment, they will be progressively rehabilitated. The settling ponds will be breached at one end to allow water to drain to surrounding vegetated areas for natural filtration. Diversion ditches will be engineered to permit the re-establishment of natural drainage. The areas will be revegetated through natural encroachment of local native vegetation. Vegetation growth will be monitored to determine if additional measures to establish vegetation are deemed necessary.

The equipment laydown and fuel storage area will be required during the construction and mineral exploration stages of the Project. This area will be constructed as close to Project infrastructure as possible, and efforts will be made to minimize the disturbed footprint. As stated above, it is anticipated that the location will be approximately 20 m in length, parallel to the proposed road, and 10 m in depth. If proper planning is done to minimize surface disturbance, natural regeneration of the area should take place without the need for additional rehabilitation work (SMEGAC, 2012).

6.3 Decommissioning and Final Rehabilitation

Final rehabilitation, carried out once operations have ceased, includes all activities required to fully restore or reclaim the property as close as reasonably possible to its former condition. This will include demolition and removal (decommissioning) of site infrastructure, revegetation and all other activities required to achieve the requirements and goals detailed in the DRP as required by regulatory bodies.

Final rehabilitation activities presented below will be carried out on the Site with the general objectives as previously noted. The decommissioning cost estimate for the road will be presented to government under separate cover. Costs for rehabilitation of exploration drill pads are considered part of operational costs and will not be included in the decommissioning cost estimate. It is anticipated that decommissioning activities will require 2-3 months to complete during favorable conditions for earthwork activities.

All provincial and local stakeholders will be consulted prior to decommissioning and rehabilitation of the resource access road to confirm whether any other authorities wish to maintain and legally accept responsibility for the road (CCME, 1991, MBMR, 2001, and SME, 2008).

6.3.1 Roads

The road decommissioning will prevent vehicular access and will consist of the procedures outlined below. The underlying soil of the resource access road and associated spurs will be loosened by excavator and blended with the organic material

that was grubbed and piled adjacent to the roadway during road construction. The organic material will be mixed into the upper surface creating a more stable and thicker growth medium to establish initial revegetation and promote natural revegetation (NLDNR, 2012). The existing drainage ditches will be infilled by use of an excavator, and the cross section contour will be shaped to match the adjacent ground. Additionally, revegetation in the form of tree seedlings will be planted along the roadbed and on erosion susceptible locations near water and on slopes, and other areas that may be distant from existing vegetation that will take longer to re-establish native species. The density of trees to be planted will be determined upon consultation with the Paddy's Pond Forest Management Office.

The restricted access to the road off the TCH will be decommissioned. Following the completion of the post-decommissioning monitoring period, the gate will be removed and an earth berm will be constructed at the entrance to block vehicular traffic (EGCMEC). A sign stating "road closed" will also be posted at the entrance.

Although the road access will have been restricted by use of a locked gate; to ensure the safety of the general public who frequent resource access roads, public notices indicating the road closure, will be posted on applicable local websites.

6.3.2 Bridge and Culverts

The bridge and any culverts installed during development will be removed and disposed of off-site at an approved facility. The culvert and bridge locations will be pulled back and back sloped at a minimum of 45 degrees (NLDNR, 2012). Rock fill will be used during construction at the permitted culvert and bridge crossing locations to achieve required stable slopes at decommissioning and continue the fish passage conditions. Permits to Alter a Body of Water required under the *Water Resources Act* from NLDOEC, Water Resources Management Division will be obtained for any work in any body of water (including wetlands) that is visible on 1:50,000 scale maps.

Despite the road decommissioning, for safety purposes due to potential ATV traffic along the former road bed, an earth berm, of a minimum of 6 m wide, 2 m deep and 1 m high, will be constructed 30 m on either side of the former bridge crossing location, clearly visible by on-coming traffic (NLDNR, 2012). Signs warning of danger due to removal of water crossing will also be posted on either side of the former bridge crossing, clearly visible in all seasons (NLDNR, 2012). Any locations where culverts were removed will be evaluated during decommissioning to determine the potential necessity for earth berms for safety reasons.

6.3.3 Re-establishment of Site Drainage Patterns and Revegetation

The rehabilitation procedures described above will be planned and carried out to ensure the general re-establishment of pre-Project surface runoff patterns. A key objective of the rehabilitation activities and program will be to create the necessary conditions for the re-establishment and long-term propagation of indigenous native species in the areas disturbed by Project-related construction and operational activities. Re-establishing appropriate site drainage will prevent ponding and water erosion on revegetated and other rehabilitated areas (NSE, 2009). These areas would include the equipment laydown and fuel storage area, trenches, and drill pads, and the following measures will be applied for rehabilitation:

- i) Disturbed areas will be suitably prepared either by scarification by excavator to loosen the soil and/or loosened and covered with a cap of local organic soils;
- ii) Grading and contouring (with the use of an excavator) the disturbed surface area as necessary to reduce erosion potential from surface runoff;
- iii) Applying an organic soil cover where it is considered necessary for vegetation growth;
- iv) Establishing vegetation, rock armour, or other low maintenance erosion control devices in areas where erosion is a potential concern from the loosened or contoured surface;
- v) Establishing initial vegetation cover on reclaimed surfaces to further minimize erosion and to permit natural revegetation of native species;
- vi) Small disturbed areas that are no greater than 1 ha (0.01 km²) in surface area will be revegetated through natural encroachment of local native vegetation (SME, 2008);
- vii) If applicable, seeding will coincide with optimal germination times (NSE, 2009), to be established in communications with silviculturalists at NLDNR prior to application;
- viii) Consideration will also be given to re-establishing native species of trees and shrubs as recommended by the NLDTW Specifications Book, 2011; and
- ix) Providing for temporary controls for erosion stability during the period of vegetation establishment.

6.3.4 Hazardous Materials and Fuel Storage

Portions of the Site may be identified at the time of decommissioning as having the potential to contain hazardous materials either in storage or in the ground as a result of normal activities and/or accidental spills. In the case of stored materials such as fuel, oils, lubricants, explosives, hazardous chemicals, and other hazardous materials, these will be removed from site and handled either by disposal, resale, or restocking in accordance with the transportation and safety procedures outlined in the appropriate Material Safety Data Handling Sheets. All such materials will be identified and inventoried and will be removed from site prior to the commencement of closure activities.

All empty fuel containers will be removed from the fuel storage area and disposed of in accordance with applicable legislation. If soils were impacted during operations, remediation will have occurred pre-decommissioning. As part of decommissioning, soil testing will be conducted in potentially contaminated areas to determine if the soil requires remediation. Upon results of these tests, Eagleridge will be able to determine if excavation and disposal of the soil in an appropriate facility is required. Handling and transportation of dangerous goods will be in compliance with the *TDGA*.

6.4 Post-Decommissioning Monitoring

Post-decommissioning monitoring will be conducted to ensure the chemical and physical stability of the Project Site, as well as effectiveness of the rehabilitation work prior to relinquishment of the land to the Crown. Eagleridge will plan and undertake any such post-decommissioning monitoring in consultation and cooperation with the relevant regulatory agencies and following the regulations and standards in place at the time.

The post-decommissioning monitoring program will follow directly from the operating (exploration activities) monitoring program to ensure continuity of data sources and provide historical data for monitoring sites. The post-decommissioning monitoring program will continue for an anticipated period of 1 to 2 years after final rehabilitation activities are completed, or to the point at which Eagleridge and the appropriate regulatory bodies are satisfied that all physical and chemical characteristics are acceptable and stable (One year of post-decommissioning monitoring has been assumed for the purposes of determining the decommissioning costs). The land will then be relinquished to the Crown. Some of the potential components of the anticipated monitoring and reporting program are provided below.

6.4.1 Physical Monitoring and Vegetation

Physical monitoring will be carried out annually and will involve a review of rehabilitation and revegetation efforts to identify erosion concerns and evaluate the sustainability and success of the vegetation programs, maintenance and repair activities associated with physical changes of structures on site. This monitoring will include a regeneration survey of the tree planting efforts and identification of potential gap planting required.

6.4.2 General Site Monitoring

The general physical aspects of the rehabilitated Site including drainage patterns, slope and embankment stability, soil surface stability, and revegetated areas will be monitored to ensure that all rehabilitation work is performing as designed.

6.4.3 Reporting

Following decommissioning, monitoring reports will be submitted on an annual basis to the appropriate regulatory bodies. The reports will define the work to be carried out in the next period, if applicable, the decommissioning and rehabilitation work that was completed in the past period and the results of monitoring.

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