ENVIRONMENTAL IMPACT STATEMENT GUIDELINES

for the

Labrador Foxtrot Rare Earth Element Mine Project

Prepared by:

The Newfoundland and Labrador Department of Municipal Affairs and Environment

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Glossary of Acronyms and Abbreviations

ACCDC	Atlantic Canada Conservation Data Centre
ANFO	Ammonium Nitrate/Fuel Oil
ARD	Acid Rock Drainage
BACT	Best Available Control Technology
CCME	Canadian Council of Ministers of the Environment
CEAA	*Canadian Environmental Assessment Act*
CEPA	*Canadian Environmental Protection Act* (1999)
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWCS	Canadian Wetland Classification System
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EC	Environment Canada
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
MAE	Newfoundland and Labrador Department of Municipal Affairs and Environment
EPP	Environmental Protection Plan
EPR	Environmental Preview Report
HADD	Harmful Alteration, Disruption or Destruction
HC	Health Canada
HCS	Newfoundland and Labrador Department of Health and Community Services
LATP	Labrador Aboriginal Training Partnership
MEND	Mine Environment Neutral Drainage Program
MBCA	*Migratory Birds Convention Act*
mg/m^3	Milligrams per cubic metre
ML	Metal Leaching
MMER	Metal Mining Effluent Regulations
NL	Government of Newfoundland & Labrador
NLEPA	Newfoundland and Labrador *Environmental Protection Act*
NLESA	Newfoundland and Labrador *Endangered Species Act*
NPAG	Non-Potentially Acid Generating
NO_x	Nitrogen Oxides
NWPA	*Navigable Waters Protection Act*
NWWG	National Wetlands Working Group
PAH	Polycyclic Aromatic Hydrocarbon
PAG	Potentially Acid Generating
PLS	Plain Language Summary
$PM_{2.5}$, PM_{10}	Particulate Matter (subscript indicates size threshold, in microns)
TC	Transport Canada
t/d	Tonnes per day
t/yr	Tonnes per year
SAR	Species at Risk
SARA	*Species at Risk Act*
SO_2	Sulphur Dioxide
SSAC	Species Status Advisory Committee
VEC	Valued Ecosystem Component
VOC	Volatile Organic Compounds

1.0 INTRODUCTION

Search Minerals Inc. proposes to construct and operate a rare earth element (REE) mine (open pit and underground) in southeastern Labrador, nine kilometres northwest of the Town of St. Lewis. The mine will progress from an open pit operating for 6 months of the year (May to October) to underground where it will operate 12 months of the year. An onsite processing mill will produce 10 tonnes of product per day and will operate year round. The product will be stored at the mill site until ready to be trucked to the destination market. Other onsite facilities will include a waste rock dump, ore stockpile, dry stack residue pad, crusher and processing facility, a polishing pond, and administrative buildings. The mine is expected to be in production for 14 years and will employ between 139 and 222 individuals.

The Project requires Environmental Assessment (EA) under the *Newfoundland and Labrador Environmental Protection Act* (*NLEPA*), specifically, the preparation of an Environmental Impact Statement (EIS). These requirements are discussed in further detail in Section 2.2.

1.1 Purpose of the Environmental Impact Statement Guidelines

These guidelines have been prepared by the Government of Newfoundland and Labrador (NL) to identify for the Proponent the nature, scope and minimum information and analysis required in preparing its EIS. The EIS is intended to address the legislative requirements of the province.

These guidelines shall not be regarded as either restrictive or exhaustive. Concerns other than those identified herein may arise during the investigations associated with the EIS. The provincial government is prepared to provide advice and assistance throughout the preparation of the EIS with regard to the identification of environmental concerns and appropriate assessment methodology.

"Environment" means the components of the Earth, and includes:

a) air, land and water, including all layers of the atmosphere;
b) plant and animal life, including human life;
c) the social, economic, recreational, cultural and aesthetic conditions and factors that influence the life of humans or a community;
d) a building, structure, machine or other device or thing made by humans;
e) a solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of humans; or
f) a part or a combination of those things referred to in subparagraphs (a) to (f) and the interrelationships between 2 or more of them.

"Environmental effect" means a change in the present or future environment that would result from an undertaking.

"Follow-up Program" means a program for:
(a) verifying the accuracy of the EA of the Project/Undertaking; and,
(b) determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the Project/Undertaking;

"Minister" means the provincial Minister of the Department of Municipal Affairs and Environment.

1.2 Guiding Principles

1.2.1 Environmental Assessment as a Planning Tool

Environmental assessment is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate the possible adverse effects of development on the environment. EA also encourages decision makers to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy.

The EA of this project shall, in a manner consistent with the purposes above:

- consider and evaluate alternatives to the Project, or its components, and alternative means of carrying out the Project, or its components, that are technically and economically feasible;
- document public and Aboriginal consultation activities in a manner that is transparent and accessible;
- propose measures to avoid or mitigate adverse environmental effects;
- propose measures to enhance or prolong beneficial environmental effects;
- describe residual (post-mitigation) environmental effects that are beneficial or harmful that are likely to be caused by the undertaking regardless of the proper application of all control, mitigation, enhancement and remedial measures to be proposed in the EIS;
- assess the cumulative environmental effects of the Project in combination with other projects and activities that have been or will reasonably be carried out in the foreseeable future;
- predict whether or not the project, in combination with other projects or activities that have been or will be carried out, is likely to cause significant adverse environmental effects after mitigation measures are implemented;
- specifically list and cite all sources of information in the EIS;

- outline the design of studies necessary to provide additional information for the preparation of the EIS;
- address concerns identified during the public information sessions or through consultations with Indigenous governments and organizations by including within the EIS specific responses to those concerns and, where appropriate, specific proposals for measures to deal with them; and
- as soon as they have been completed, provide copies of all reports or studies undertaken in order to satisfy these guidelines.

1.2.2 Local Knowledge and Indigenous Traditional Knowledge

Local knowledge and Indigenous traditional knowledge refers to the broad base of knowledge held by individuals and collectively by communities that may be based on spiritual teachings, personal observation and experience or passed on from one generation to another through oral and/or written traditions.

Local knowledge and Indigenous traditional knowledge, in combination with other information sources, can help in achieving a better understanding of potential effects of projects. Local knowledge and Indigenous knowledge may, for example, contribute to the description of the existing physical, biological and human environments, natural cycles, resource distribution and abundance, long and short-term trends, and the use of lands and water resources. It may also contribute to project site selection and design, identification of issues, the evaluation of potential effects and their significance, the effectiveness of proposed mitigation, cumulative effects assessment and the consideration of follow-up and monitoring programs.

Indigenous traditional knowledge, which is rooted in the traditional life of Indigenous people, can be an important contribution to an EA. Certain issues relevant to the review process are firmly grounded in Indigenous traditional knowledge such as harvesting, use of lands and resources for traditional purposes, cultural well-being, land use and heritage resources. Although the basis for Indigenous traditional knowledge and western science-based knowledge can differ, they may on their own or together, contribute to the understanding of these issues.

The EA will promote and facilitate the contribution of local knowledge and Indigenous traditional knowledge to the review process, and recognize that approaches to local knowledge or Indigenous traditional knowledge, customs and protocols may differ among communities and persons with respect to the use, management and protection of this knowledge.

The Proponent shall incorporate into the EIS the local knowledge and Indigenous traditional knowledge to which it has access or that it may reasonably be expected to acquire through appropriate due diligence, in keeping with appropriate ethical standards and without breaching obligations of confidentiality. The EIS must state how the proponent have obtained and incorporated Indigenous traditional knowledge.

1.2.3 Sustainable Development

Sustainable development means development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. The EIS shall consider the extent to which the Project would meet this objective.

EA provides a systematic approach for identifying, predicting and evaluating the potential environmental effects of projects before decisions are made. In addition, EA provides the means to identify mitigation measures for adverse effects. EA enables the integration of environmental factors into the planning and decision-making process in a manner that promotes sustainable development and contributes to decision making that can ultimately provide net ecological, economic and social benefits to society. Moreover, a project that is supportive of sustainable development strives to incorporate citizen participation into decision-making.

The EA of the Project, including its analysis of alternatives, shall take into account the relationships and interactions among the various components of the ecosystems, including the extent to which biological diversity may be affected by the Project, and how the Project meets the needs of the present as well as future populations.

1.2.4 Precautionary Approach

One of the purposes of EA is to ensure that Proponents consider the Precautionary Principle. If a project has the potential to cause a threat of serious or irreversible damage to the environment, the Proponent must take all reasonable environmental protection measures to protect the environment, even if full scientific knowledge is lacking.

The Proponent shall indicate how the precautionary principle was considered in the design of the Project in at least the following ways:

- demonstrate that all aspects of the Project have been examined and planned in a careful and precautionary manner in order to ensure that they would not cause serious or irreversible damage to the environment, especially with respect to environmental functions and integrity, considering system tolerance and resilience, and/or the human health of current or future generations;
- outline and justify the assumptions made about the effects of all aspects of the Project and the approaches to minimize these effects;
- evaluate alternative means of carrying out the Project and compare them in light of risk avoidance and adaptive management capacity;
- in designing and operating the Project, demonstrate that priority has been given to strategies that avoid the creation of adverse effects;
- develop contingency plans that explicitly address accidents and malfunctions, e.g., environmental emergency plans;
- identify any proposed follow-up and monitoring activities, particularly in areas where scientific uncertainty exists, in the prediction of effects or effectiveness of proposed mitigation measures; and
- present public views on the acceptability of all of the above.

2.0 THE ENVIRONMENTAL ASSESSMENT PROCESS

2.1 Contact for the Environmental Assessment

Brent Keeping
Chair, Environmental Assessment Committee
Environmental Assessment Division
Department of Municipal Affairs and Environment
PO Box 8700
St. John's NL A1B 4J6
(709)729-4223
bkeeping@gov.nl.ca

2.2 Environmental Assessment Requirements

2.2.1 Newfoundland and Labrador Environmental Protection Act

Any mining of a mineral as defined in the *Mineral Act* in Newfoundland and Labrador is subject to EA under the *NLEPA* and *Environmental Assessment Regulations, 2003.* The Environmental Assessment

Division of the Newfoundland and Labrador Department of Municipal Affairs and Environment (MAE) administers the process including:

- consulting at every stage with interested government departments, the public and Indigenous governments and organizations;
- evaluating submissions by Proponents and reviewers, including Indigenous governments and organizations;
- advising the Minister on potential environmental effects prior to decisions; and
- monitoring released projects to ensure compliance and effectiveness of mitigation.

An undertaking that is subject to the NLEPA is required to be registered for examination by MAE. The registration outlines the proposed project and describes how it will affect the bio-physical and socio-economic environments. The Registration is referred to provincial and federal government departments and to appropriate Indigenous governments and organizations for review and comment. The Registration is also publicly available for comment. At the conclusion of the review period, the Minister advises the Proponent whether the undertaking has been released from further assessment or will require an Environmental Preview Report (EPR), an EIS, or if it has been rejected. On January 25, 2018 the Minister advised Search Minerals Inc. that an EIS was required.

2.2.2 Delegated EIS Preparation

Pursuant to the requirements of Section 51(1)(b) of the NLEPA, the Proponent has been delegated the task of preparing the EIS. The EIS should be prepared according to these guidelines and, once completed, the Proponent shall submit printed and electronic copies of the EIS to the involved government agencies in the quantities specified in Table 1. In addition, the Proponent shall make printed copies of the EIS and the Plain Language Summary (PLS) of the EIS available at public viewing centers (to be designated) in the project vicinity.

In accordance with the requirements of the Government of Newfoundland and Labrador, baseline studies will be required to define baseline conditions, and to support the evaluation of environmental effects and/or the development of mitigation measures as well as monitoring and follow up programs.

Table 1 Environmental Impact Statement Copy Requirements

Organization	Electronic Copies *		Printed copies	
	EIS	PLS	EIS	PLS
MAE	20	20	8	10

Organization	Electronic Copies *		Printed copies	
	EIS	PLS	EIS	PLS
Public Viewing Locations (TBD)	1	5	2	5 at each location

*Electronic copies to be provided on CD or USB drive.

Baseline studies are discussed further in section 4.15.

2.3 Consultation

Indigenous governments and organizations and the public will have several opportunities to participate in the EA and provide their views on the potential environmental effects of the Project. These are outlined in Table 2.

Table 2: Indigenous and Public Participation Opportunities

Opportunity	Duration
Comment on Draft EIS Guidelines	40 days
Comment on Component Studies	35 days
Comment on Proponent's EIS or Plain Language Summary (PLS)	50 days
Comment on any additional EIS requirements, i.e., Addendum (if required by the Minister)	50 days

Electronic and hard copy versions of documents will be provided to MAE and these will be made available for Indigenous and public review. Key documents will be available on the MAE Environmental Assessment webpage. http://www.mae.gov.nl.ca/env_assessment/projects/Y2017/1936/index.html.

Public comment periods will be announced in newspapers and on the MAE Environmental Assessment webpage noted above. Interested parties may contact the EA Committee Chair identified in Section 2.1 for further information regarding comment periods.

The Proponent is required to provide current information about the project to the public and especially to the communities likely to be most affected by the project as early as possible in the review process. This will ensure that all parties have an opportunity to gain an understanding of the proposed Project and may facilitate their continued involvement in the EA process. During the preparation of the EIS, the Proponent

must hold public information sessions to provide information concerning the Project to the people whose environment may be affected by the undertaking. The Proponent must record and respond to the concerns of the local communities regarding the potential environmental effects of the Project. Appendix A provides additional information on the notification requirements for the information sessions.

2.3.1 Aboriginal Consultation

The Government of Newfoundland and Labrador (NL) is committed to consulting Indigenous governments and organizations when NL contemplates making land and resource development decisions that have the potential to adversely affect asserted or proven Aboriginal rights.

NL strives for a practical consultation process that helps to ensure that land and resource development decisions minimize or, where reasonably practicable, eliminate potentially adverse effects on asserted or proven Aboriginal rights.

NL also aims to maintain, foster and improve effective working relationships among Indigenous governments and organizations, project Proponents and NL.

In particular, NL's consultation process is intended to produce better communication, stronger relationships and easier resolution of issues among Indigenous governments and organizations, the project Proponent, and NL.

Consultation should be conducted with the objective of helping ensure that land and resource development decisions minimize or, where reasonably practicable, eliminate adverse effects on asserted or proven Aboriginal rights.

For clarity, Government will consult only those Indigenous governments and organizations which have asserted or proven Aboriginal rights in the Project area.

To assist the consultation processes, the EIS must describe the concerns raised by Indigenous governments and organizations in respect of the Project and, where applicable, how they have been or will be considered and, where appropriate, addressed. This should include a summary of discussions, as well as issues or concerns raised and any potential adverse impacts on asserted or proven Aboriginal rights.

The Proponent must ensure that it engages with Indigenous governments and organizations whose asserted Aboriginal rights or any rights established pursuant to a final land claim agreement to which NL is a party may be adversely affected by the Project. In preparing the EIS, the Proponent must ensure that it provides sufficient, early notification; and timely, updated information to Indigenous governments and organizations to ensure they are reasonably informed about the Project. The Proponent shall also discuss with Indigenous governments and organizations the most practical and appropriate method of consultation. This will require the Proponent to provide up-to-date information describing the project to the relevant Indigenous governments and organizations, and especially to the communities likely to be most affected by the Project. The Proponent shall also involve Indigenous governments and organizations in determining how best to deliver that information (e.g., the types of information required, formats, and the number of community meetings required).

The EIS must document any potentially adverse environmental effects on asserted Aboriginal rights or on any rights established pursuant to a final land claim agreement to which NL is a party that could be caused by a Project-induced change in the environment, as well as any measures taken or recommended that would prevent, mitigate, or otherwise address these effects. NL will use this information towards fulfilling its duty to consult Indigenous governments and organizations about the Project. In addition to Proponent-involved Indigenous engagement, NL may undertake additional engagement activities directly with Indigenous government and organizations.

For further information on Aboriginal consultation, please refer to the Government of Newfoundland and Labrador's Aboriginal Consultation Policy on Land and Resource Development Decisions ("The Policy"), April 2013 for more detailed information.
http://www.gov.nl.ca/iias/publications/Aboriginal_consultation.pdf

2.3.2 Record of Aboriginal & Public Consultation

The EIS must describe all Aboriginal and public consultation activities undertaken by the Proponent prior to, during, or planned after the EA. It should describe key stakeholder groups, summarize comments heard, identify key issues of concern raised by Indigenous governments and organizations and the public and the Proponent's responses.

3.0 SCOPE OF PROJECT, FACTORS TO BE CONSIDERED AND SCOPE OF THE FACTORS

3.1 Scope of Project

The EIS will examine all activities and physical works associated with the construction, operation, rehabilitation and closure of the proposed Project, as described in the Proponent's project description dated November 28, 2017 including, but not limited to, the activities listed below.

The mine and associated facilities and infrastructure will be located wholly within south-eastern Labrador. The Project will include construction, operation, rehabilitation and closure of the following components:

- an open pit and underground mine including infrastructure to dewater and to manage groundwater levels;
- process facility;
- dry stack residue pad;
- low grade stockpile;
- waste rock dump / overburden stockpiles;
- modification to the St. Lewis diesel generation plant and transmission lines;
- ancillary infrastructure to support the mine and process plant (e.g., gatehouse, polishing pond, truck shop, raw water pond, explosives magazine storage, crusher, water pump house, chemical pipeline, sewage and water treatment units, etc.);
- mobile mining and support equipment;
- access and haulage roads; and
- St. Lewis port facilities.

3.2 Factors to be Considered

The EIS shall consider:

- the purpose of the Project;
- alternatives to the Project;
- the need for the Project;
- alternative means of carrying out the Project or components of the Project that are technically and economically feasible and the environmental effects of any such alternative means;

- the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
- the significance of the environmental effects;
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
- comments from Indigenous governments and organizations;
- comments from the public that are received in accordance with NLEPA regulations or practice;
- local knowledge and Indigenous traditional knowledge;
- the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future; and.
- the requirements of a follow-up program for the Project.

3.3 Scope of the Factors to be Considered

In addition to the factors listed above, the EIS shall document any additional issues or concerns that may be identified through regulatory, stakeholder, Aboriginal and public consultation.

The assessment of environmental effects shall focus on valued ecosystem components (VECs). A VEC is a component or attribute that is important for its ecological, legal, scientific, cultural, economic or aesthetic values. VECs for the project should be selected based on defined criteria and their selection justified. The assessment shall consider potential environmental effects that the Project may have on each VEC.

In considering VECs, the Proponent will recognize that:

- the value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans (e.g.. cultural and economic significance);
- culture and way of life of those using the area affected by the Project may also be considered as VECs; and
- functional relationships within the environment may also be considered as VECs.

The EIS will define the study areas and time frames, or spatial and temporal boundaries used in the analysis of environmental effects, including cumulative effects. It is expected that the spatial and temporal boundaries shall vary between VECs to reflect the nature of both the VEC and the predicted effects. Temporal and spatial boundaries must reflect:

- the geographic range over which the project's environmental effects may occur, recognizing that some effects shall extend beyond the project area;
- timing/scheduling of project activities;
- natural variations of each VEC;
- the time required for recovery from an effect; and
- cumulative effects of other projects and activities to VECs.

The VECs to be considered must include:

- atmospheric environment including air quality, greenhouse gas emissions and noise. landforms, soils, snow and ice;
- water resources (surface water and groundwater);
- wetlands;
- birds, other wildlife and their habitats;
- Species at Risk and species of conservation concern;
- current and future use of lands and culturally significant resources;
- community services and infrastructure;
- health and community health; and
- economy, employment and business.

It is understood that the process for defining VECs is iterative and that the Proponent may add other VECs. In addition, the EIS shall include a consideration of key organisms that live off or rely on bio-physical VECs during their life cycle. Rationale for the selection of the above VECs, as well as a proposed study approach, is provided in Section 4 of these guidelines and is to be presented in the EIS for all VECs. The EIS shall describe, in detail, study methods and analytic methods, including incorporation of information gathered through consultation and Indigenous traditional knowledge.

4.0 PREPARATION OF THE EIS

The EIS is a statement of the Proponent's environmental conclusions and commitments related to the Project; it must be explicitly endorsed by the Proponent.

The EIS shall employ the clearest language possible. However, where the complexity of the issues addressed requires the use of technical language, a glossary defining technical words and acronyms shall be included. The Proponent must also prepare a Plain Language Summary (PLS) to accompany the EIS.

The PLS is described in Section 4.2 and will be used to facilitate Aboriginal consultation and aid public review of the conclusions of the EIS.

The EIS shall be a stand-alone document upon which a critical review can be undertaken. Where external sources of information or data are used, they shall be referenced within the body of the EIS and listed completely at the end. Where conclusions that are critical to the assessment of environmental effects are cited from other reports, the EIS shall provide sufficient detail of the originating data and analysis to enable a critical review of that material and submit reference material as an appendix to the EIS.

These guidelines shall be considered along with the Government of Canada EIS guidelines in the production of one set of EIS documents that meet the requirements of both jurisdictions. The EIS shall include a Table of Concordance to these Guidelines, so that information requirements identified herein can be easily located in the EIS. The EIS shall refer to, rather than repeat, information previously presented in other sections of the document. However, it is important that underlying limitations, uncertainties and assumptions of all environmental predictions, especially those that support major statements or conclusions, be described in the body of the EIS rather than simply referencing supporting studies. A key subject index is to be provided giving locations in the text by volume, section and sub-section.

The EIS shall provide charts, diagrams and maps wherever useful to clarify the text, including a depiction of how the developed Project sites will appear from both an aerial and terrestrial perspective. Where possible, maps shall use common scales to allow for comparison and overlay of mapped features and shall indicate common and accepted local place names. Where technically feasible, provide geographic information in standard Geographic Information System (GIS) mapping (digital) format. The EIS and all associated reports and studies shall use System International (SI) units of measure and terminology.

The following sections describe the different topics to be addressed in the EIS. The EIS must provide sufficient information to allow readers to understand the potential environmental effects of the Project, focusing on the most significant potential effects as identified by the Proponent and through these guidelines. The EIS must provide an acceptable rationale for not fully addressing any issue identified in the guidelines and must highlight key effects that require more intensive investigation.

Section 4 is organized into two parts:

- PART I: CONTENT OF THE EIS describes the layout and required content of the EIS; and

- PART II: DETAILED GUIDANCE ON SELECT ENVIRONMENTAL COMPONENTS provides an overview of the recommended studies and approach for each VEC.

The information included in this document is not intended to be exhaustive and additional detail, studies, or examination of additional components may be required.

PART I: CONTENT OF THE EIS

4.1 Executive Summary

The EIS should begin with an Executive Summary, including a concordance table that describes where each information requirement of the EIS Guidelines has been addressed in the EIS.

4.2 Plain Language Summary

In order to enhance understanding of the EIS and facilitate consultation activities, a Plain Language Summary (PLS) of the EIS must be prepared. The PLS will summarize the Project and the major findings and conclusions of the EIS. It must be a stand-alone document no longer than approximately 50 pages, excluding annexes and appendices. It should clearly describe the Proponent, the Project (including rehabilitation and closure activities), and the environmental effects of the Project. Maps at appropriate sizes and scales must be included to clearly show the location of all Project components and/or environmental components. As the name implies, the PLS should avoid unnecessary use of technical terms or jargon and be written so that an average reader with no specialist knowledge of mining or EA can comprehend the Project, the analysis of environmental effects, the conclusions reached, and the supporting rationale. The PLS should be organized as follows:

Introduction

- Project Overview
- Environmental Assessment Process
    - Purpose of the EIS
    - Provincial EA Requirements

Project Description

- Purpose of and Need for the Project
- Project Description
    - Location
    - Components
    - Activities
    - Schedule

Scope of the Assessment

- Scope of the Project
- Factors to be Considered
- Scope of the Factors
    - Identification of VECs
    - Spatial and Temporal Boundaries

Project Alternatives

- Alternatives to the Project
- Alternative Means of Carrying out the Project
    - Description of Alternative Means
    - Environmental Effects of Technically and Economically Feasible Alternative Means
    - Selection of a Preferred Alternative Means

Consultation

- Public and Aboriginal Consultation and Engagement Activities undertaken for the EA (Proponent and Government)

Existing Environment

Environmental Effects Assessment

- Method and Approach
- VECs (effect matrix should be provided)
    - Potential Environmental Effects
    - Mitigation Measures
    - Residual Environmental Effects
    - Comments from Government, Public and Indigenous governments/organisations and Proponent's Response
- Effects of the Environment on the Project
    - Method and Approach
    - Potential Effects
    - Mitigation
    - Residual Effects
    - Comments from Government, Public and Indigenous governments/organisations and Proponent's Response

- Effects of Possible Accidents or Malfunctions
    - Method and Approach
    - Potential Effects
    - Mitigation
    - Residual Effects
    - Comments from Government, Public and Indigenous governments/organisations and Proponent's Response

- Effects on Capacity of Renewable Resources
- Cumulative Environmental Effects
    - Approach
    - Scoping
    - Potential Cumulative Effects
    - Mitigation Measures
    - Residual Effects
    - Comments from Government, Public and Indigenous governments/organisations and Proponent's Response

Follow-Up Program

Benefits of the EA to Newfoundlanders and Labradorians

Overall Conclusions of the Proponent

It is understood that the Proponent can only provide responses to comments from Government, Public, and Indigenous governments/organisations to the extent known at the time of writing, as there will be further comment periods after the EIS submission.

4.3 Project Information

4.3.1 The Proponent

The EIS shall:

- identify the Proponent and the name of the legal entity that would develop, manage and operate the Project;
- provide contact information for the Proponent (e.g., name, address, telephone, e-mail);
- explain corporate and management structures, as well as insurance and liability management related to the Project;
- explain corporate environmental, Indigenous relations and community relations policies;
- specify how the Proponent will ensure that corporate policies are implemented and respected for the Project;
- summarize key elements of its environmental management system and how it would be integrated into the Project; and
- identify key personnel, contractors and/or sub-contractors responsible for preparing the EIS. The qualifications of biologists conducting surveys for migratory birds, species at risk and species of conservation concern and wetland delineations should be provided in an appendix to the EIS.

4.3.2 Project Overview

The EIS shall briefly summarize the development proposal. If the Project is a component of a larger operation, the EIS shall outline the larger context and present the relevant references, if available. The Project location should be described in the context of surrounding land uses and infrastructure. The intent of this overview is to provide the key components and the location of the Project, rather than a detailed description, which shall follow as described in Section 4.4.4 of this document.

The electronic format of the EIS document must be unsecured/unrestricted to allow electronic searches, note taking, highlighting and copy functions.

4.3.3 Regulatory Framework and the Role of Government

The EIS should identify the EA process and the government bodies involved in the assessment. It should also describe the process used to determine the requirement for the provincial EA. In addition, the EIS shall:

- identify the environmental regulatory approvals and legislation that are applicable to the Project at provincial and municipal levels, including:
    - activities requiring regulatory approval;
    - names of permits or regulatory approvals;
    - names of legislation applicable in each case; and
    - names of the regulatory agencies responsible for each permit or approval;
- identify environmental government policies, resource management, planning or study initiatives pertinent to the Project and discuss their implications;
- identify any relevant Land Use Plans, Land Zoning and/or Community Plans;
- describe land tenure in the vicinity of the Project;
- identify and delineate major components of the Project and identify those being applied for and constructed within the jurisdiction of these approvals processes under provincial legislation; and
- provide a summary of the regional, provincial and/or national objectives, standards or guidelines that have been used by the Proponent to assist in the evaluation of any predicted environmental effects.

4.3.4 Non-Government Participants in the Environmental Assessment

The EIS shall identify the main participants in the EA including Indigenous governments and organizations, community groups and environmental organizations.

4.3.5 Land Claims Agreements and Asserted Aboriginal Rights

The EIS shall identify any publicly available agreements or arrangements entered into between the Proponent and/or the Government of Newfoundland and Labrador and/or Indigenous government(s) organization(s) in the context of land claims and, where applicable, address how they may affect or be affected by the Project.

4.3.6 Other Registrations

The Proponent shall indicate whether any other registrations have previously been submitted in relation to this Project, or are to be submitted for EA in the future as a result of this Project.

4.4 Project Description

4.4.1 Purpose of and Need for the Project

The EIS shall state the purpose of the Project, from the Proponent's perspective and clearly describe the need for the Project (i.e., the problem or opportunity the Project is intended to solve or satisfy). This is the fundamental rationale for the Project and provides the context for the consideration of alternatives to the Project.

The statement of the Project's justification shall be presented in economic terms, shall provide a clear description of methods, assumptions and conclusions used in the analysis and shall include an evaluation of the following:

- current and forecasted demand for rare earth elements;
- market opportunities, forecasts and expected evolution;
- risks to the Project, including market prices and schedule delays, interest rates and other risk factors relevant to the decision to proceed with the Project; and
- projected financial benefits at the regional, provincial and national levels.

4.4.2 Alternatives to the Project

The EIS must include an analysis of alternatives to the Project; describing functionally different ways to meet the Project's need and purpose. The EIS shall:

- identify the alternatives to the Project that were considered;
- develop criteria to identify the major environmental, economic and technical costs and benefits of the alternatives; and
- identify the preferred alternatives to the Project based on the relative consideration of the environmental, economic and technical costs and benefits.

The level of detail for this analysis must be sufficient to allow the reader to understand the alternatives and how they compare to the Project. The analysis of alternatives to the Project is to provide clearly described methods and criteria for comparing alternatives and sufficient information for the reader to understand the reasons for selecting the preferred alternative and for rejecting others. This analysis shall include a description of the conditions or circumstances that could affect or alter these choices, such as market conditions, regulatory changes and other factors, either prior to construction or during the life of the Project.

The EIS shall include a comparative analysis of the environmental effects and technical and economic feasibility of alternatives that led to the choice of the selected Project alternative. The EIS shall demonstrate how the preferred alternative contributes to sustainable development. The Proponent shall include an evaluation of the thresholds for economic viability of the Project and considerations respecting the timing of phases and components of the Project.

In assessing alternatives, the Proponent is encouraged to take into account any potentially adverse effects of the technically and economically feasible alternatives on asserted or proven Aboriginal rights.

4.4.3 Project Location

The EIS shall provide a concise description of the geographical setting in which the Project shall take place. The description shall focus on aspects of the environment that are important for understanding the potential environmental effects of the Project, including:

- any existing designated or planned environmentally sensitive or significant areas; national, provincial and regional parks; protected natural areas and watersheds; ecological reserves; wetlands; riverine and lacustrine fish habitats; mature and interior forest habitat for migratory birds; and habitats of designated species at risk, including critical habitat for the designated species; areas of concentration of other wildlife; and other sensitive areas and habitat including any areas used for recreational activities;
- the current land use in the area and the relationship of the Project facilities and components with any existing or future land use including traditional, private and crown lands; and
- a description of the nearest potentially sensitive human receptors such as residences, cabins, sacred sites, culturally significant sites, places of worship, hospitals etc. and of local communities that may be affected by project activities.

The location of the mine site and transportation corridors shall be described and clearly indicated on maps of appropriate scale. The location map should include the boundaries of the proposed site and transportation corridors, major existing infrastructure, municipal drinking water supply areas (protected and unprotected) if applicable, adjacent land uses and important environmental features. In addition, site plans/sketches and photographs showing project location, site features and the intended locations of project components should be included.

4.4.4 Project Description

4.4.4.1 Facilities and Components

The EIS shall describe all of the Project's facilities and components in detail, focusing on those with the most potential for environmental interactions and risk (e.g., Project "footprint" wastes and emissions and associated zones of influence). The EIS shall present descriptions, locations, plans, figures and/or drawings for each facility, as appropriate, to convey information on potential environmental interactions, including:

- waste rock storage (including discussion of ore contaminants that may affect processing and volume of waste rock);
- overburden storage areas:
- low grade ore stockpile;
- dry stack residual pad including an analysis of potential leachate/runoff from it;
- process facility;
- mine (open pit and underground) facilities;
- all effluent generation, treatment systems, handling and discharge locations, as well as all anticipated effluents and contaminants, including ammonia residue from blasting operations;
- air emission sources (e.g., diesel generators, heavy equipment, roads, waste rock, crushing, grinding, process heaters, dryers, blasting, etc.);
- noise sources, expected noise levels and noise monitoring locations;
- sources and frequency of vibrations;
- water control structures or diversions that may be required to facilitate the project;
- all utility installations, including transmission lines, towers and poles;
- 12.5km acid pipeline and stream crossing and wetlands as the pipe may have to have a secondary containment system, such as an over-sized pipe sleeve;
- 2.5km water supply pipeline;
- all infrastructure construction, including haulage roads, docks/wharves and ancillary structures;

- fuel storage systems, including secondary containment (dykes) and a list of fuels;
- storage, transport, preparation and usage, and final discharge of all process reagents and effluents;
- any quarries that are contemplated as part of the Project;
- viewscapes that could be affected by the Project; and
- water quality sampling locations in the watersheds potentially affected by the project.

4.4.4.2 Activities

The EIS shall include descriptions of the construction, operation, maintenance, foreseeable modifications, including the expansion and lengthening of the operations and, where relevant, rehabilitation and closure of sites and facilities associated with the Project. Detailed descriptions of activities to be carried out during each phase of the Project should include the location, magnitude and scale of each activity, including labour force and procurement requirements. A schedule must be provided, showing time of year, frequency and duration of project activities.

The description of the construction and operation activities shall include:

- annual quantity of all fuels that will be combusted in the boiler(s) and mobile equipment;
- quantification of the annual facility-wide emissions of Total Particulate Matter, PM10, PM2.5, Sulphur Dioxide, Nitrogen Oxides and metals;
- number and size of blasting events;
- throughput / sizing details of all equipment to be used on-site including stationary and mobile equipment;
- details of all pollution control equipment that will be installed.solid waste, hazardous waste and waste reduction strategies;
- discharge (accidental and controlled) of process reagents and effluents;
- spill potentials and prevention strategies (e.g., hydraulic hose ruptures, fueling mishaps, tank failure, acid pipeline failure); and
- rehabilitation strategy for waste rock, overburden storage or other areas.

The EIS should describe proposed means to treat waste resulting from the Project and/or the capacity of contractors to do so.

The EIS should describe any regular inspection and maintenance that may be required for the mine and associated facilities and infrastructure. Activities involving periods of increased environmental disturbance or the release of materials into the environment are to be highlighted.

The level of detail in the description of the Project's facilities and activities shall be sufficient to enable prediction of environmental effects.

4.4.4.3 Labour Force Requirements

The EIS shall include descriptions of the construction, operations, rehabilitation and closure labour force requirements, including:

- the National Occupation Classification (NOC) 2006 codes (at the 4-digit level) associated with each position for all phases of the project, including the number of positions associated with each NOC 2006 code;
- qualifications, certifications and other requirements, including the need for, location and availability of related training opportunities (e.g., post-journeyperson training) associated with key positions for all phases of the project;
- the approximate timelines for each of the positions during the construction and operations phases of the project, including the number of positions for each 4-digit NOC 2006 code throughout the project at specified time intervals (monthly, or at least quarterly) to show levels of employment throughout the Project timeline;
- whether the positions are full-time equivalent or actual positions. If they are actual positions, the breakdown of full-time and part-time or full-year and part-year positions;
- an estimate of the number of apprentices (by level and trade) and journeypersons (by trade) required;
- the identification of any specialized training required, such as post-journey training;
- the estimated percentage of the hired workforce from Newfoundland and regionally for Labrador;
- the estimated percentage of the contracted workforce from NL;
- breakdown of workforce by gender;
- target for employment for Indigenous peoples;
- the identification of any training partnerships being developed (i.e. Labrador Aboriginal Training Partnership) to facilitate Project workforce attachment for Indigenous peoples and women;
- a commitment to provide two summary reports (one at the halfway point of construction phase and one at construction end) indicating all of the above;
- commitment to develop and obtain government approval of a Gender Equity and Diversity Plan (GEDP) prior to the start of construction. The GEDP must ensure employment and training opportunities for four target groups: women, Indigenous people, visible minorities and people with disabilities; and

- strategies for recruitment- if applicable.

4.4.5 Alternative Means of Carrying out the Project

The EIS must identify and describe alternative means of carrying out the Project, or components of the Project, that are technically and economically feasible. The analysis shall describe:

- the alternative means considered, whether they are technically and economically feasible and the rationale for rejecting alternatives;
- a description of the conditions or circumstances that could affect or alter these choices, such as market conditions, regulatory changes and other factors, either prior to construction or during the life of the Project;
- the environmental effects of the technically and economically feasible alternatives, in sufficient detail to allow comparison with the effects of the Project; and
- the preferred means of carrying out the Project or its components based on the relative consideration of environmental effects including the criteria and rationale for their selection.

Any potentially adverse effects of the technically and economically feasible alternative means on asserted or proven Aboriginal rights must also be identified.

The EIS shall analyze and compare the design alternatives for the Project in relation to their environmental and social costs and benefits, including those alternative means that cost more to build and/or operate but which result in reduced adverse environmental effects or more durable social and economic benefits.

At a minimum, the discussion of alternative means of carrying out the Project shall include:

- waste rock storage management and location;
- dry stack residual pad and location;
- overburden storage and management;
- storage, transport, and final discharge of all process reagents;
- pit dewatering options;
- contracting or lengthening of the operations;
- labour supply;
- mining methods;
- reclamation methods; and
- Transportation options, road, wharf, etc.

4.5 Description of the Existing Environment

The EIS shall provide a description of the biophysical and socio-economic environments that could be affected by the Project, both in the immediate vicinity and beyond. This shall include the components of the existing environment and environmental processes, their interrelations and interactions, as well as their variability over time scales appropriate to the effects analysis. The level of detail shall be sufficient to:

- identify, assess and determine the significance of adverse environmental effects that may be caused by the Project;
    - include a discussion of how the Project is expected to co-exist with the existing nearby communities of St. Lewis and Port Hope Simpson, i.e. town infrastructure and healthcare services;
- identify and characterize the beneficial effects of the Project; and
- provide the data necessary to enable effective follow-up.

The baseline description shall characterize environmental conditions resulting from historic and present activities in the local and regional study area. The physical and biological environments shall be described based on an ecosystem approach that considers both scientific, traditional and cultural knowledge and perspectives regarding ecosystem health. The EIS must identify and justify the selected indicators and measures of ecosystem health (i.e., measurable parameters). These indicators should be transferable to future project monitoring and other follow- up.

In assessing effects to the biological environment, the EIS shall consider the resilience of relevant species populations, communities and their habitats. It shall summarize all pertinent historical information on the size and geographic extent of relevant fauna or floral populations as well as density, based on best available information. Where little or no information is available, and when appropriate, specific studies shall be designed to gather information on species populations and densities that could be adversely affected by the Project. Habitat at regional and local scales must be defined when mapping aquatic and terrestrial vegetation types and/or communities.

Habitat use at regional and local scales should be characterized by type of use (e.g., breeding, migration, feeding, nursery, rearing, wintering), frequency and duration. Emphasis must be on those species,

communities and processes most sensitive to project effects. However, the interrelations of these components to the greater ecosystem and communities of which they are a part must be indicated. The EIS must address issues such as habitat, nutrient and chemical cycles, food chains and productivity, to the extent that they are appropriate to understanding the effects of the Project. Range and probability of natural variation over time must also be considered.

The EIS must provide a description of the rural and Indigenous communities likely to be affected by the Project, including demographic, economic, social and community health information. If the information available from government or other agencies is insufficient or no longer representative, the Proponent shall complete the description of the environment with current surveys and studies.

The EIS shall indicate the Project's proximity to sensitive features such as residences, cabins, public drinking water supplies, sacred sites, culturally sensitive sites, places of worship and locations of hunting and gathering activities (i.e., country foods collection). Depending on the type of potential effects the Project may have on these receptors, appropriate baseline evaluation should be undertaken (e.g., baseline noise, surface soil, air quality, drinking water, groundwater resources, country foods evaluation etc.).

The EIS must also describe existing geology, geochemistry, soils and terrain at the mine site and in the immediate vicinity.

The EIS must explain any extrapolation, interpolation or other manipulation applied to the baseline data used to describe environmental conditions in the study area. Any information gaps from a lack of previous research or practice shall be described indicating information that is not available or existing data that cannot accurately represent environmental conditions in the study area over four seasons. If data gaps remain, the Proponent shall describe its efforts to resolve the data gaps, including any direct consultation with groups, individuals and others.

4.6 Effects Assessment

The EIS shall contain a comprehensive analysis of the Project's predicted effects on the environment, including cumulative effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out. The assessment shall include, but not be limited to, the effect of any environmental change on health, socio-economic conditions and heritage values. Potential effects from all components of the Project at the site and within the Project's zone of influence shall be discussed. The EIS shall predict the Project's effects during all project phases (e.g., construction,

operation, maintenance, foreseeable modifications, closure, decommissioning and reclamation) and describe them using appropriate criteria.

The environmental effects assessment in the EIS shall be based on best available information and methods. The methods employed shall be clearly explained. All conclusions must be substantiated and the supporting logic clearly traceable. The Proponent is encouraged to make use of existing information relevant to the project. When relying on existing information to meet the requirements of various sections of the EIS Guidelines, the Proponent must include the information directly in the EIS or clearly direct (e.g., through cross-referencing) the reader to where they may obtain the information. With respect to potential pre-existing baseline studies, the Proponent will append these to the EIS as distinct appendices. When relying on existing information, the Proponent must also comment on how the data have been applied to the project, clearly separate factual lines of evidence from inference and state any limitations on the inferences or conclusions that can be drawn from them according to the criteria for information quality set out in the EIS Guidelines. For instance:

- assumptions should be clearly identified and justified;
- all data, models and studies must be documented such that the analyses are transparent and reproducible;
- the uncertainty, reliability and sensitivity of models used to reach conclusions must be indicated;
- conclusions should be substantiated; and,
- the studies should be prepared using best available information and methods.

Modeling methods and equations presented must include information on margins of error and other relevant statistical information (e.g., confidence intervals, possible sources of error).

The Proponent shall prepare a table describing the proposed Project's anticipated effects, which shall enable the reader to review and consider those effects.

Views of Indigenous governments and organizations and the public relative to the EA, including any perceived changes in the environment from the Project, must be acknowledged and considered. In considering the local social and economic effects of the Project, the Proponent shall have due regard for the attitudes, beliefs and perceptions of local residents and how these are grounded in their culture, social organizations and historical experience. The EIS shall clearly articulate how relevant issues raised by Indigenous governments and organizations and the public have been considered, including any changes to the Project, or mitigation or follow-up measures arising from such consideration.

4.6.1 Accidents and Malfunctions

The EIS shall identify and describe accidents and malfunctions that may occur as a result of project activities, including an explanation of how those events were identified, potential consequences (such as potential environmental effects), worst case scenarios and the effects of these scenarios and assess the significance of associated environmental effects. The EIS should identify potential accidents, malfunctions, unplanned events (e.g., premature or permanent shutdown), or emergency situations that could be associated with all phases of the Project, including product spills, fuel transportation and storage, resource road conflicts with wildlife and other users as well as the probabilities and hazards associated with them; the safeguards that have been established to protect against such occurrences and the contingency/emergency response procedures in place in the event that an accident/malfunction occurs, including the potential impact on local health care services. Factors which contribute to the uncertainty of detecting and mitigating effects associated with accidents and malfunctions must be assessed. Special consideration must be given to the potential of malfunctions and accidental events that could affect local potable surface water and groundwater resources.

Given the potential for accidents and malfunctions to affect potable surface water and groundwater resources, including a public water supply, the EIS should discuss how an accident scenario would be managed (e.g., notification, response, backup water supply etc.).

4.6.2 Capacity of Renewable Resources

The EIS shall consider the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future. The EIS shall identify any VECs predicted to experience significant adverse residual environmental effects, describe how the Project could affect their sustainable use and describe the criteria used in the analysis.

4.7 Avoidance and Mitigation Measures

Mitigation is the elimination, reduction or control of the adverse environmental effects of the Project. It includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. The EIS must consider measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project. The approach to mitigation shall be premised on a preference for avoidance and reduction of effects at their source, including modifying the Project design or its components as well as relocation of certain components, where technically and economically feasible.

The EIS shall describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures that will be applied. The Proponent, where possible, should refer to similar situations where the proposed mitigation has proven to be successful. Mitigation failure should be discussed with respect to risk and severity of consequence.

The EIS shall describe the Proponent's Environmental Protection Plan (EPP) and the Environmental Management System (EMS) through which it will be delivered. The EPP shall provide an overall perspective on how potentially adverse effects would be minimized and managed over time. The Proponent shall describe its commitments, policies and arrangements directed at promoting beneficial or mitigating adverse socioeconomic effects and explain how it will ensure compliance among its contractors and sub-contractors and how compliance will be audited and enforced.

The EIS shall specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the Project's phases (construction, operation, modification, decommissioning, abandonment or other undertaking related to the Project) to eliminate or reduce the significance of adverse effects. The EIS shall also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. The Proponent shall discuss the application of the Precautionary Principle in the identification of mitigation measures. The Precautionary Principle is defined in Section 1.2.4.

If there are technically and economically feasible mitigation measures that were considered and rejected, the EIS must discuss these and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation must be justified. The Proponent must identify who is responsible for the implementation of these measures and the system of accountability.

Should the Project be released, the Proponent must ensure that measures are taken to avoid or lessen any potential adverse effects, regardless of their significance, on listed or designated species, their critical habitat or the residences of individuals of those species. Potential effects must be monitored and mitigation must be consistent with any applicable recovery strategy and action plans. The EIS must include information that will allow the Province to meet this requirement.

In addition, the EIS will identify the extent to which technology innovations will help mitigate environmental effects. Where possible, it will provide detailed information on the nature of these measures, their implementation and management, as well as whether follow-up will be required.

4.8 Cumulative Effects Assessment

The EIS must include an analysis of cumulative effects of the Project in combination with other projects or activities that have been or will be carried out. The objective of an EA is not to define two classes of environmental effects. Rather, a single set of environmental effects that take into account the aggregate effect of the Project in the context of other foreseeable developments and activities acting upon the environment should ultimately be identified.

The analysis of cumulative effects must consider different types of effects (e.g., synergistic, additive, induced, spatial or temporal) and identify impact pathways and trends. The EIS shall assess the significance of the residual cumulative environmental effects that remain after mitigation has been implemented. Notably, a cumulative effect on a VEC may be important even if the effects of the Project on the VEC are not significant.

The EIS shall:

- identify and justify the VECs that will constitute the focus of the cumulative effects assessment. For greater certainty, cumulative effects must be assessed in relation to each VEC for which a residual effect of the Project is predicted to be adverse and likely (regardless of the significance of the effect). The assessment should examine the likelihood, nature and extent of the predicted cumulative effects of the Project in combination with other projects and activities that have been or will be carried out. It may be appropriate, during the course of the EA, to refine the definition of VECs selected for cumulative effects assessment;
- present a justification for the spatial and temporal boundaries of the cumulative effects assessment. The boundaries for the cumulative effects assessment will depend on the VECs being considered (e.g., will generally be different for different VECs). The boundaries for the cumulative effects assessment will also generally be different from (larger than) the boundaries for assessing effects of the Project;
- describe and justify the choice of projects and selected activities for the cumulative effects assessment. These shall include past activities and projects, those being carried out and future projects or activities likely to be carried out;
- describe the mitigation measures that are technically and economically feasible;
- determine the significance of the residual cumulative effects; and
- assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the Proponent's responsibility that could be effectively applied to mitigate these effects, the Proponent shall identify these effects and the

parties that have the authority to act. In such cases, the Proponent shall summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term..

The following projects (as well as planned expansions and extensions) may interact cumulatively with the Project:

- Lower Churchill Generation Project; and
- Labrador-Island Transmission Link Project.

These and other projects and activities (e.g., road development, tourism etc.) should be considered in assessing cumulative effects to VECs. Notably, the cumulative effects assessment should be focused on key VECs and their potential stressors, rather than on providing detailed descriptions of other projects.

The methods used to scope and assess cumulative effects should be clearly described in the EIS, demonstrating how conclusions have been reached.

4.9 Effects of the Environment on the Project

In addition to describing environmental effects on the environment as a result of the undertaking, the EIS should also describe the climatic conditions at the project site and in local and regional study areas and provide a description of seasonal variations and trends in climatic conditions, to allow the assessment of effects on the Project. Any use of off-site data must be described and an analysis of its degree of representativeness for Project conditions must be included. The use of the data should be qualified with an understanding of local and regional variability and the geographic locations of any onsite and offsite meteorological stations. The geographic locations of any onsite and offsite meteorological stations must be provided. Climate data should also be provided and taken into account when evaluating effects of the project on air quality, hydrology and water management. The influence of local and regional topography or other features that could affect conditions in the study area should also be considered, as appropriate. Specifically, the EIS shall include a description of the following components:

- Physiography: topography, drainage network;
- Climate: historical records of total precipitation (rain and snow), mean, maximum and minimum temperatures;

- Geological context: bedrock and surficial cover stratigraphy and composition, geotechnical properties and structural geology features such as fractures and faults, in the mine area and where major project infrastructures and earthworks are proposed (e.g., mine facilities);
- Hydrogeological context: hydrogeological characteristics of the different geological units (hydraulic conductivities, porosity, storage coefficients); groundwater geochemistry and groundwater levels for the areas that will be disturbed by major projects;
- Streamflow data records (levels and yields) of surroundings lakes, rivers and brooks;
- Geotechnical properties of Quaternary sediments, such as slope stability and bearing capacity of facility foundations under both static and dynamic conditions, including ground ice and thermal conditions.

The EIS must predict how local conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g., flooding, ice jams, rock slides, landslides, fire, outflow conditions and seismic events) could adversely affect the project and how this in turn could affect the environment (e.g., environmental emergencies due to extreme environmental conditions). The EIS should describe measures that will be implemented to prevent and respond to such events. The EIS should discuss the sensitivity of the project to changes in specific climate and related environmental parameters, including total annual rainfall, total annual snowfall, frequency and/or severity of precipitation extremes, watercourse levels and stream flow.

In addition, the EIS shall discuss:

- potential geotechnical and geophysical hazards within the Project area, including potential seasonal subsidence, seismicity and faulting, risks associated with cut/fill slopes and constructed facilities. Where appropriate, the assessment should be supplemented by illustrations such as maps, figures, cross sections and drill hole logs;
- potential effects on foundation stability of major Project components from geological fractures and faults and associated implications of these features on project planning and engineering design. Those Project components assessed shall include, but are not limited to the mine facilities;
- potential for acid rock drainage and metal leaching;
- potential effects of the groundwater level on mining operations; and
- potential effects of climate change on the Project.

The EIS must provide measures and strategies to mitigate the potential effects of the environment on the project.

4.10 Environmental Management

4.10.1 Planning

The EIS shall describe the proposed Environmental Management Plans (EMPs) for all stages of the Project and include a commitment by the Proponent to implement the EMPs, should the Project proceed. EMPs must be developed in consultation with government agencies, Indigenous governments and organizations, the public and other stakeholders. This may occur after the EA, but must be consistent with the information presented in the EIS. Pertinent legislation, regulations, industry standards, documents and legislative guides shall be used when developing EMPs.

The EIS shall also outline a preliminary decommissioning and reclamation plan for the Project. The plan must address ownership, transfer and control of the different Project components, as well as the responsibility for monitoring and maintaining structures. The EIS shall include a conceptual discussion of how decommissioning of permanent facilities may occur.

4.10.2 Follow-Up Program

The EIS must include a framework upon which follow-up, including effects monitoring, would be based throughout the life of the Project, including the post-closure phase. A follow-up program must be designed to verify the accuracy of the effects predictions and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the Project.

The follow-up program must be designed to incorporate pre-project baseline information (including modeling data), as well as compliance data (e.g., established benchmarks, regulatory documents, standards or guidelines) and real-time data (e.g., observed data gathered in the field). Effects predictions, assumptions and mitigation actions that will be tested as part of the follow-up program must be framed as field-testable monitoring objectives. The monitoring design should include a statistical evaluation of the adequacy of existing baseline data, to provide a benchmark against which to test for project effects and the need for any additional pre-construction or pre-operational monitoring to augment baseline data.

A schedule for follow-up frequency and duration is required after an evaluation of the length of time needed to detect effects, given estimated baseline variability, likely magnitude of environmental effect and desired level of statistical confidence in the results (Type 1 and Type 2 errors).

The description of the follow-up program should include;

- the requirements and objectives of the follow-up program;
- a description of the main components of the program, each monitoring activity under that and the objectives of each monitoring activity (i.e., confirmation of mitigation, confirmation of assumptions and verification of predicted effects);
- a schedule for the finalization and implementation of the follow-up program;
- a description of the roles and responsibilities for the program and its review process, by government, Indigenous governments and organizations and the public;
- a discussion of possible involvement of independent researchers;
- any contingency procedures/plans or other adaptive management provisions for dealing with unforeseen effects, or situations where benchmarks, regulatory standards or guidelines are exceeded; and
- a description of how results will be managed and reported.

Sufficient detail shall be provided to allow independent judgment as to the likelihood that the follow-up program will provide the quantity and quality of information required to achieve its objectives.

The NL *Endangered Species Act* and the federal *Species at Risk Act* (SARA) contain provisions requiring that measures be taken to monitor adverse effects of a project on listed wildlife species or their habitat. If potential adverse effects on a listed wildlife species or its critical habitat are identified, a monitoring plan must be developed to identify the circumstances under which corrective measures may be needed to address any issue or problem identified through the monitoring (i.e., if unanticipated effects occur or the importance of effects is greater than anticipated). The monitoring plan should clearly describe how government departments responsible for the species in question would be engaged in reviewing proposed adaptive management measures, in the event that mitigation measures are not effective.

4.11 Significance of Residual Adverse Environmental Effects

The EIS must describe any expected residual effects of the Project on the biophysical and human environments, after technically and economically feasible mitigation measures have been applied. The residual effects, even if deemed not significant, should be described. The EIS shall provide sufficient detail so that the environmental effects of the Project and the degree to which they can be mitigated, can be clearly understood.

The criteria for evaluating the significance of the residual effects (including cumulative effects) shall be described, including pre-defined significance thresholds for each VEC (e.g., existing government

regulatory and industry standards and guidelines). The criteria may include: magnitude; duration and frequency; ecological or socioeconomic context; geographic extent; and degree of reversibility. Professional expertise and judgment may also be applied. The EIS must contain enough detail to enable readers to follow the reasoning and process by which the Proponent assessed the significance of effects.

The EIS must state the Proponent's conclusion, for each VEC, as to whether the Project in combination with the cumulative effects of other projects and activities is likely to cause significant adverse effects. Residual effects significance criteria shall be presented for each VEC in the EIS along with the analysis to support the conclusion of significance.

4.12 Economic and Social Benefits of the Project

Information on the predicted economic and social benefits of the Project should be presented. This information shall be considered by the Government in assessing the justifiability of any significant adverse environmental effects, if necessary.

The Proponent must demonstrate prudent resource management in compliance with Section 6.(1b) of the *Mining Act*, to the satisfaction of the Minister of Natural Resources.

4.13 Benefits of the EA to Newfoundland and Labrador

The EIS must describe how the EA process for the Project benefits Newfoundlanders and Labradorians, focusing on aspects such as:

- maximized environmental benefits: What expected environmental benefits will be created as a result of the project being assessed?;
- contribution of the EA to sustainable development: Describe how the EA process for the project is expected to contribute to the concept of sustainable development for a healthy environment and economy;
- Aboriginal consultation: How Aboriginal consultation throughout the EA is expected to influence the project design and the environmental effects analysis;
- public participation: How public participation in the EA is expected to influence the project design and the environmental effects analysis;
- technological innovations: How new technologies expected to be developed to address environmental effects that could be used for other projects;
- increases in scientific knowledge: How any new scientific information expected to be collected through the EA or follow-up that could benefit the assessment of other projects; and

- community and social benefits: Describe any expected changes in project design that would result in indirect benefits to communities and/or social benefits for the local area, region and province.

4.14 Assessment Summary and Conclusions

The EIS must summarize the overall findings of the EA, with emphasis on the main environmental issues identified. It must predict the likely significance of adverse environmental effects, including accidents and malfunctions, caused by the Project.

For all VECs, the EIS must include a table that summarizes:

- the Project's potential adverse environmental effects;
- proposed mitigation and compensation measures;
- proposed follow-up;
- potential residual effects;
- potential cumulative effects;
- potential effects of accidents and malfunctions on the VEC;
- applicable standards or guidelines;
- comments from the public and responses;
- comments from Indigenous governments and organizations responses;
- relationship of the VEC to an Indigenous government's/organization's asserted or proven Aboriginal rights; and
- commitments made by the Proponent, including the timing and responsibility of each.

PART II: DETAILED GUIDANCE ON SELECT ENVIRONMENTAL VECS

The following section provides an overview of the proposed studies and approach to be undertaken in the EIS for each VEC. Detailed study approaches and analytic methods and assumptions shall be provided in the EIS.

4.15 Baseline Studies

Due to the complexity of a number of VECs likely to be affected by the Project, it has been determined that stand alone baseline studies will be required to support the evaluation of environmental effects, the development of mitigation measures and monitoring and follow up programs. Where new information becomes available, additional baseline studies may be required.

As a means to address limited resource capacities, where feasible, the proponent is encouraged to provide Baseline Studies as they become available to potentially affected Indigenous governments and organizations in advance of the formal submission of the EIS to government.

Baseline studies should generally have the following format:

- Rationale/Objectives: In general, the baseline studies should be conducted to obtain all required data for use in determining the potential for significant effects on a the VEC as well as for monitoring and follow-up programs.
- Study Area: The boundaries of the study area shall be defined depending on the characteristics of the VEC being investigated.
- Methods: Methods shall be proposed by the Proponent, in consultation with resource agencies, as appropriate. The methods used in each baseline study shall be described in the EIS.
- Study Outputs:
    - Study outputs shall be proposed by the Proponent. Information and data generated shall be sufficient to adequately predict the effects on the VEC and to determine monitoring and follow-up requirements;
    - Identification of information sources; and
    - Appendix of raw data in electronic tabular form for the bio-physical baseline studies.

The baseline studies, in their entirety, should be incorporated into the EIS document as appendices.

4.16 Atmospheric Environment

The effects of the Project on atmospheric environment will be assessed within the area that can reasonably be affected by the Project, based on the distance to sensitive receptors. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out may be different from (larger than) the boundaries for assessing the effects of the Project.

4.16.1 VEC Definition and Rationale for Selection

Atmospheric environment is defined as ambient air quality and the acoustic and visual environments (e.g., noise, vibrations, light) within the vicinity of the Project as well as greenhouse gasses emitted. Atmospheric environment has been selected as a VEC based on:

- protection of human health and safety, as well as ecological health and aesthetics;

- potentially sensitive human and wildlife receptors;
- provisions of the *Canadian Environmental Protection Act (1999)*(CEPA), and provisions of the *Air Pollution Control Regulations, 2004* under the NLEPA; and
- the potential for greenhouse gas emissions.

4.16.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- Effects on ambient air quality and greenhouse gas emissions, including those generated by Newfoundland and Labrador Hydro for electricity generation to support the project, due to;
    - particulate matter (e.g., dust) and other potential air contaminants during construction activities; and
    - particulate matter (e.g., dust) and other contaminant releases during the operations phase, including those potentially caused by:
        - mining operations;
        - handling or loading and unloading;
        - road dust (e.g., vehicle use on-site and off-site);
        - dust along hydro lines;
        - emissions from blasting; and
        - vehicle emissions.

- Effects on ambient sound levels associated with:
    - construction activities (both at the mine and off-site);
    - mining and processing operations (including blasting); and
    - vehicles/trucks in noise-sensitive areas (e.g., residential areas).

- Effects as a result of vibrations associated with:
    - construction-related activities, such as blasting or heavy equipment movement on-site or off-site; and
    - mining and processing operations (including blasting).

- Effects of artificial lighting at the project site during operation on nearby residents and the environment.

4.16.3 Existing Environment

The EIS must describe the following:

- ambient air quality in the Project areas and, for the mine site, the results of a baseline survey of ambient air quality, focusing on, but not limited to, metals and the contaminants $PM_{2.5}$, and NO_x;
- current ambient noise levels at the mine site and within the local area, including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations must be included; and
- existing ambient light levels at the Project site and at any other areas where Project activities could have an effect on light levels. The EIS should describe night-time illumination levels during different weather conditions and seasons.

4.16.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on the atmospheric environment must be assessed for all phases of the Project. In addition, the effects of potential accidents and malfunctions and cumulative effects associated with other industrial use of the area, must be assessed.

All potential Project emissions must be estimated, including greenhouse gases (GHG) and an emissions inventory table must be included in the EIS, listing emission sources, operating periods and pollution control equipment (where applicable). Typical construction and operation-related emissions include, but are not limited to, particulates ($PM_{2.5}$) and metals in dusts and fuel combustion by-products such as sulphur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals. Potential odours from Project emissions at a local level (i.e., near Project equipment) must be discussed and assessed.

Estimates of total annual greenhouse gas emissions (GHG) by source (e.g., stationary combustion, mining explosives, on-site transportation (e.g., in-pit mining trucks), off-site transportation (e.g., on-road vehicles), marine transportation, on-site electricity generation, and off-site electricity generation at the St. Lewis diesel generating station owned by Newfoundland and Labrador Hydro) and fuel consumption by type (e.g. gas, diesel, propane) should be provided for the operational phase of this project. In addition to the estimates, the proponent should identify any mitigation measures proposed to minimize greenhouse gas emissions. GHG quantities are to be expressed in carbon dioxide equivalents (t/yr) by gas and should be compared with provincial and national totals and mining sector totals.Modeling shall be conducted in accordance with the requirements of the *Air Pollution Control Regulations* of the NLEPA, the Guidance

Document for Reporting Greenhouse Gas Emissions for Large Industry in Newfoundland and Labrador, and the following MAE guidance documents:

- *Guidance for Plume Dispersion Modeling* (GD-PPD-019.2) and
- *Determination of Compliance with the Ambient Air Quality Standards (GD-PPD-009.4)*

Air dispersion modelling conducted in accordance with the above guidelines shall be summarized in the EIS. Air quality modeling shall provide meteorological data (e.g., for wind data – wind roses) and examine scenarios whereby air quality in nearby communities (e.g., St. Lewis) could be affected by the cumulative effects of the Project in combination with other projects and activities in the area. Dispersion modelling for operations will be required which includes emissions from the major sources operated by the Proponent, as well as the emission from any neighbouring proposed facilities.

Modeling shall include the Total Particulate Matter, $PM_{2.5}$ and PM_{10} fraction of particulate matter, NO_x emissions from operational equipment and any other emissions of concern that are identified, (e.g., metals in dust, CO, and SO2) as well as greenhouse gas emissions. The modeling should specify all assumptions with respect to emission rates and dust control applications. The analysis must reflect the requirements and standards contained in pertinent legislation, policies, guidelines and directives relating to the atmospheric environment (e.g., National Ambient Air Quality Objectives, Canada Wide Standards, applicable provincial ambient air quality criteria and the Guidance Document for Reporting Greenhouse Gas Emissions for Large Industry in Newfoundland and Labrador).

Any significant particulate emission source will be required to have Best Available Control Technology (BACT) for dust suppression. A description of proposed emission controls should be included in the EIS. The EIS should also indicate whether and how air quality in local municipalities will be monitored and with whom any resulting data will be shared.

The proponent must also demonstrate that BACT for (GHG) emissions have been considered in the planning for this project. Such analysis will accommodate for technical and economic feasibility, and should not conflict with existing BACT guidelines under the Air Pollution Control Regulations.

The EIS must assess potential noise and vibration effects to the environment and local communities. Specifically, the EIS must:

- identify and quantify potential noise and vibration sources during construction and operation phases;

- identify potential receptors and describe the proximity of identified receptors to the Project area, including identifying and describing whether particular receptors may have a heightened sensitivity to noise and vibration exposure (e.g., schools, childcare centres, workers accommodations near the mine installations, snowmobile trails) or expectation of peace and quiet (e.g., recreational areas);
- include a map illustrating estimated noise and vibration levels from the Project at key receptors; describe whether there is a potential for adverse effects associated with Project-related vibrations (e.g., potential for damage to nearby residences, domestic wells, ice cover on nearby lakes); and
- describe mitigation and management measures related to noise and vibration including the conditions for mitigation and evaluate Project compliance with appropriate noise guidelines such as those provided by Health Canada (see Health Canada's 2017 *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise* https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-noise.html).

Technically and economically feasible mitigation measures must be proposed to reduce or minimize adverse effects. The EIS will provide a prediction of adverse residual effects, including cumulative effects and their significance.

4.17 Landforms, Soils, Snow and Ice

4.17.1 VEC Definition and Rationale for Selection

Landforms, soils, snow and ice are defined as those within the vicinity of the Project or that could be affected by the Project. They have been included as a VEC because of their importance to project planning and potential to be affected by Project activities.

4.17.2 Potential Project-VEC interactions

Potential Project-VEC interactions include:

- Acid Rock Drainage/Metal Leaching (ARD/ML) arising from Project activities;
- Naturally Occurring Radioactive Material (NORM) arising from Project activities;
- effects to the quality or quantity of soils;
- effects to snow and ice; and
- effects of landform and soils on the Project.

4.17.3 Existing Environment

The description of the existing environment in the EIS shall include:

- existing unique or valuable landforms (e.g., eskers, fragile landscapes), including details regarding their ecological functions and distribution in the local study area;
- geomorphology and topography at areas proposed for construction of major project components, including the type, thickness and distribution of soils as applicable;
- bedrock lithology, morphology, geomorphology and soils where earthworks are proposed;
- potential for ground and rock instability (e.g., slumping, landslides and potential slippage) at areas planned for Project facilities and infrastructure;
- baseline soil chemistry (particularly with respect to background metals in soils); and
- suitability of topsoil and overburden for use in the re-vegetation of surface-disturbed areas.

4.17.3.1 Acid Rock Drainage and Metal Leaching

An acceptable Acid Rock Drainage / Metal Leaching / (ARD/ML) program report for the project (both open pit and underground) must be submitted to, and approved by the Department of Natural Resources prior to the submission of the EIS. The phased ARD/ML sampling and testing program is to be conducted on representative samples of all material management units (ore, waste rock, overburden, quarry materials and tailings) and must follow the "Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials", MEND Report 1.20.0 December, 2009.

The results must be interpreted by an ARD/ML qualified person (QP) and the conclusions must clearly state the potential for acid rock drainage and metal leaching (using MEND, 2009 terminology) for each management unit. All QP recommendations regarding acid rock drainage and metal leaching mitigation/prevention and management strategies shall be carried out by the proponent and must be integrated into the project design.

The QP ARD/ML report shall also address the adequacy of the number of representative samples collected on each geologic material, the types of tests conducted on the samples, recommendations for further testing and investigation, and provide specific details regarding the ongoing testing and monitoring program used to verify the initial ARD/ML program results.

The QP's ARD/ML report must include the geologic unit and spatial distribution (x,y,z) for each sample to ensure that an adequate number of samples were taken from each unit. The results must be representative of the unit in question considering the unit's variability and/or homogenous nature. As per

the MEND (2009) guidelines, the QP should use the Neutralization Potential Ratio (NPR) in assessing ARD potential. Considerations in setting NPR criteria for classification of PAG vs Non-PAG must include site specific factors that may alter the relative magnitude of AP and NP as well as safety factors that account for limitations in the precision and accuracy of sampling.

If there is a potential for ARD/ML to occur, the EIS ARD/ML program report investigation should include the following:

- the design of the ARD/ML program and if a phased program, the chronology of ARD/ML investigations (include all mineralogy, elemental analysis, static and kinetic test work conducted to date);
- determination of the distribution of sample test results for each lithological/alteration/waste management unit. The assessment should account for vertical and horizontal distribution, as well as sampling biases, to permit proper characterization of the unit including the units range of variability;
- the rationale, advantages and disadvantages including a description, for all test work;
- predictions of the ARD/ML potential of all material management units (ore, waste rock, overburden, quarry materials and tailings) to be disturbed or created during all phases (construction, operation, decommissioning, reclamation and post-closure) of the proposed project. This must include an interpretation of the results, an estimation of risk for the onset of ARD for each lithological/alteration/waste management unit and the predicted drainage chemistry for each unit (including the types and concentrations of major trace elements); and
- clear, concise cross-sections which relate the ARD/ML assessment (static/kinetic sample locations and results), geology and Project development plans.

4.17.3.2 Naturally Occurring Radioactive Materials (NORM)

Naturally Occurring Radioactive Materials (NORM) can sometimes be associated with the mining and processing of rare earth metals. If this is a concern for this project, then a comprehensive NORM Plan is required to address all activities associated with this operation (eg. rock stockpiles, cleaning of minerals, dust, slime, equipment , tailings, etc.). Any potential impacts of radiation release to adjacent properties, workers, the public and other ecological receptors should be discussed, as well as mitigation strategies.

Refer to the NORM Guidance Document (GD-PPD–079.1) for information to be included in a plan: http://www.mae.gov.nl.ca/env_protection/waste/index.html#wmsgd

4.17.4 Effects Assessment and Mitigation

In conducting the analysis, the EIS shall consider pertinent acts, best practices, policies, guidelines and directives. The EIS shall provide a description of measures to mitigate effects and list potential residual effects and their significance. The discussion should include a list of:

- rehabilitation measures for borrow sources;
- an erosion and sediment control plan; and
- measures to mitigate changes to local drainage patterns.

Specifically, the EIS shall discuss the following:

- general effect on landforms as a result of Project development, borrow resource extraction, with a focus on sensitive landforms and those serving as wildlife habitat;
- implications to the Project planning and design of baseline information related to terrain conditions;
- potential effects on the stability of terrain in the vicinity of Project facilities and infrastructure. Discussion should focus on the potential for effects arising from surface disturbances due to construction (e.g., overburden stripping, cuts/fills) and any associated implications for Project design and management of project components, including access roads, ore/waste rock piles, etc.;
- the potential for the occurrence, frequency and distribution of terrain hazards, including snow drifts and snow banks, as a result of construction activities (e.g., cut/fill, extraction of construction materials);
- potential for soil erosion, resulting from surface disturbances associated with the construction, operation and maintenance of Project components;
- proposed commitments to preserve, store and reuse soil (including humus layers and organic soils), as applicable for site rehabilitation;
- potential contamination of soils due to the deposition of air emissions and airborne fugitive dust-fall from the Project;
- potential contamination of snow due to runoff from waste rock, emissions or other sources; and
- potential for the Project to affect ice on local lakes.

4.17.4.1 Acid Rock Drainage and Metal Leaching

The QP shall assess the potential leachate risks and make recommendations regarding acid rock drainage /metal leaching prevention/mitigation and management strategies. These strategies shall be carried out by the proponent and must be integrated into the project design. The QP ARD/ML report shall provide recommendations for further testing, and provide specific details regarding the ongoing testing and monitoring program to verify the initial ARD/ML program results, including

- the ARD/ML prediction information (based on MEND guidelines) and historical site databases (if available) and experience will be used to assess the potential leachate risks and determine mitigation requirements for the project. Site specific information should be provided for: mine waste rock, ore characterization, volumes, segregation/disposal methods, mitigation/management plans, contingency plans (e.g., environmental emergency contingency plans) operational and post-closure monitoring and maintenance plans;
- the feasibility of successfully segregating Potentially Acid Generating (PAG) and Non-Potentially Acid Generating (NPAG) waste materials during operations, proposed geochemical segregation criteria and identification of operational methods that will be required to achieve geochemical characterization during operations (i.e., geochemical surrogates, on site lab, procedures needed etc.);
- sensitivity analysis to assess the effects of imperfect segregation of waste rock;
- estimates of potential lag time to ARD/ML onset for PAG materials (including various waste rock, ore) and ability to fully saturate appropriate PAG materials during operation and post-closure based on regional experience, if any;
- open pit and underground water chemistry (existing, during operation & post-closure) and pit closure management measures (e.g., flooding). This should include geochemical modeling of pit water quality in the post-closure period;
- surface and seepage water quality from the mine waste rock stockpiles, other stockpiles and other infrastructure during operation and post-closure; and
- ARD/ML prevention/management strategies under a temporary or early closure scenario, including ore.

The manual produced by the Mine Environment Neutral Drainage (MEND) Program, entitled, *MEND Report 1.20.1, Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials, Version 0 - December 2009* will be used to formulate ARD/ML prediction.

4.17.4.2 NORM

The EIS must describe the potential impacts of radiation release to adjacent properties, human and other ecological receptors and present mitigate measures will be implemented. The EIS must also provide:

- confirmatory sampling methods and frequencies, including radiochemical analysis for wastewater, groundwater, sludge and scale samples (equipment);
- NORM survey methods (e.g. screening, worker/contamination), the frequency of surveys and survey instruments. Provide diagrams as needed outlining the process;
- measures to manage contaminated equipment and off site contamination from trucks and associated scale accumulation;
- containment arrangements for the disposal of tailings generated during processing of thorium bearing minerals be implemented to ensure that environmentally mobile radionuclides are not released into the surrounding environment;
- controls to manage radon gas; and
- measures to manage mineral stockpiles that may contain radioactive minerals in concentrations to produce radiation levels and radon will be secured.

4.18 Water Resources

The effects of the Project on water resources will be assessed within the local and regional drainage areas that can be reasonably expected to be affected by the Project. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out may be different from (larger than) the boundaries for assessing the effects of the Project.

4.18.1 VEC Definition and Rationale for Selection

Water resources include the quality and quantity of groundwater and surface water resources in the vicinity of the Project. It has been selected as a VEC because of:

- its importance to ecosystem function and human use (including potable water supplies; recreational use, cultural practices and protection of aquatic life);
- concerns regarding potential for release of hazardous materials on-site and potential contamination associated with mine and process water management;
- possible lowering of water table and effects on surface water / groundwater interactions (e.g., wetlands, etc.); and,
- provisions of the NL *Water Resources Act*.

4.18.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- effects related to mine water management as well as effects on water quality from effluent discharges and seepage;
- potential ammonia contamination from incomplete combustion of exploded materials (e.g., directly to surface waters, or to groundwater via bedrock fractures);
- effects on water quantity and hydrology/hydrogeology;
- effects related to mine water use (demand);
- effects of accidents and malfunctions; and
- erosion and sedimentation, including dust deposition.

4.18.3 Existing Environment

4.18.3.1 Groundwater

The EIS must describe the hydrogeologic conditions at the Project site, including a conceptual model of groundwater flow. This should include a groundwater flow model to evaluate how the project will affect groundwater flow in the vicinity of the site, and whether or not there would be any adverse effect on surface water. The model must incorporate all available existing hydrogeology and hydrologic information required to assess the effects of the Project. Where knowledge gaps exist, the Proponent must collect additional baseline information and provide it in the EIS.

The EIS must include:

- a review of the physical geography and the geology of the Project area as it pertains to local and regional groundwater flow systems in the Project area (see list in Section 4.9);
- the physical and geochemical properties of hydrogeological units, such as aquitards (see list in Section 4.9);
- groundwater levels and a piezometric map for each aquifer, or in the absence of distinct aquifers, indication of shallow and deep groundwater occurrence;
- bedrock structure, and fracture sizes and orientations in relation to groundwater flow, including hydrogeologic maps and cross-sections for the Project area that outline the extent of aquifers, including stratigraphy, piezometric levels at different depths (to estimate vertical hydraulic gradients and show confined aquifers)/potentiometric contours; locations of wells, boreholes, springs, lakes and streams; groundwater flow direction;

- groundwater flow patterns and chemistry, identifying recharge and discharge areas and identifying groundwater interaction with surface waters;
- evaluation of discharge rates;
- assessment of groundwater quality in the different aquifers; and
- a description of any local and regional potable groundwater resource in the area.

Baseline information must include existing water supply wells (if any) identified within the area of influence of the Project property. A representative number or wells should be analyzed for general chemistry parameters.

4.18.3.2 Surface Water

The EIS should describe existing surface water quality, hydrology, bathymetry, and sediment quality within the area of influence of the Project. The baseline should provide the basis for the assessment of potential effects to surface water, presenting the range of water and sediment quality and surface water hydrology. A time-series graph of key variables and stream flows must be provided to illustrate patterns and variability. The full range of stream flow characteristics, in addition to mean values, should be described.

Furthermore, the EIS must:

- include delineation of pre-development drainage basins, at appropriate scales;
- include delineation of drainage basins altered by development including direction of flow;
- describe and present monitored hydrological data, such as water levels, bathymetry and flow rates in local streams and selected local lakes, including Freshwater Pond;
- verify that names of all ponds are in agreement with the Geographical Names of Canada database;
- ensure that monitoring stations are included in the receiving environment as well as at end of pipe;
- consideration should be given to the installation of Real Time Water Quality Stations in all potentially affected watersheds;
- describe and assess hydrological regimes, including monthly, seasonal and year-to-year variability, normal flows, low flows, environmental (maintenance) flows and flood flows for selected return period flood events;
- include flows or design peak flows for selected periods for the Project area, including an estimate of runoff to delineated altered drainage basins from diverting flows around the mine;

- describe the interactions between surface water and groundwater flow systems under pre-development conditions and potential effects on these interactions during the various phases of the Project;
- identify any local surface water users (i.e., potable or recreational use);
- provide seasonal water quality field and lab analytical results and interpretation at several representative local stream and lake monitoring stations established at the Project site;
- establish precipitation monitoring at higher elevations above MASL to assist with runoff assessments; and
- estimate loss of groundwater recharge to Tub Harbour Pond.

4.18.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on Water Resources must be assessed for all phases of the Project and potential accident scenarios. The EIS will describe the potential effects to waterbodies within the Project footprint.

With respect to accident scenarios, the discussion of effects to both ground and surface water resources must include an analysis of effects of malfunctions and accidents events, taking into account:

- the proposed transportation routes through the Project site (e.g., roads);
- the use of explosive products (e.g., emulsion explosives, ANFO);
- pipeline ruptures and leaks;
- transportation of fuel for the Project (e.g., mine equipment) including offloading from port to land facilities. The EIS must describe potential accidents and malfunctions associated with the transportation of fuel on and to the Project site; and
- the management, storage and disposal of used oil and associated potential for malfunctions and accidents events.

4.18.4.1 Groundwater

The EIS must assess the effects of the Project on groundwater at the mine site. The effects assessment should provide a quantitative groundwater analysis to determine how Project-related facilities and activities will affect groundwater flows, quality and quantity, such as any effects to nearby lakes and streams, during all Project phases, including day-to-day operations and for malfunctions and accidental events. The assessment should describe the duration, frequency, magnitude and spatial extent of any effects and outline the need for mitigation and/or monitoring measures. Seepage rates, locations, quality and direction into or from the mine, overburden/waste rock/ore stockpiles, settling pond and effects on

groundwater stream flows and groundwater quality within the Project area should be assessed. Potential seepage to existing water bodies should be assessed (in relation to potential effects to fish and fish habitat, including baseflow recharge from groundwater). Mitigation strategies should be proposed.

The environmental considerations, including effects on groundwater resources that have influenced the location and management of proposed groundwater monitoring and water supply wells, shall be provided.

In summary, the following components should be provided:

- a monitoring plan for groundwater levels and quality, before, during and after the Project;
- estimation of water inflows into the mine and withdrawal rates from the mine;
- assessment of a hydrological budget, including runoff, evapotranspiration and recharge rates under the various operation phases of the mine;
- a description of the duration, frequency, magnitude and spatial extent of any effects to surface and groundwater resources caused by the Project (e.g., use maps and cross-sections developed in Section 4.18.3.1 to show effects); and
- a description of potential cumulative and residual effects of the overall Project on regional water resources and their significance.

The EIS must also specify what groundwater wells, for supply or dewatering purposes are proposed on site as part of the Project and how they will be constructed and located in relation to the various mining activities in order to minimize effects on groundwater quality.

The analysis must be based on acts, policies, guidelines and directives relating to groundwater quality and quantity, such as the *Guidelines for Canadian Drinking Water Quality (2017) https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf*. The EIS must describe measures to mitigate effects on groundwater quality and quantity and predict adverse residual effects and their significance.

4.18.4.2 Surface Water

The EIS must assess the effects of the Project on surface water quality and quantity within the Project's zone of influence. Potential watershed effects associated with the dewatering and the creation of waste rock and overburden storage areas must be described. The assessment should describe the duration, frequency, magnitude and spatial extent of any effects and outline the need for mitigation and/or

monitoring measures. The analysis of effects to surface water should include malfunctions and accident events. The EIS shall:

- include a detailed environmental water balance for the mine site, focused on predicted water balance inputs/outputs for a climate normal condition, dry- and wet- year conditions undertaken for major Project facilities including the mine, waste rock and overburden storage areas. For Project areas whose footprint will expand over time, the EIS will assess the respective change in environmental water balance over Project life including the decommissioning and post-closure period;
- provide a detailed operational and post-closure water balance for mine water management plan identifying Project water demands/uses and water source(s), potential effects on water sources and proposed mitigation to avoid or minimize effects;
- identify water and sediment quality objectives, including the receiving water criteria of the Canadian Council of Ministers of the Environment (CCME) including the *Canadian Environmental Quality Guidelines for the Protection of Aquatic Life* and the *Guidelines for Canadian Drinking Water Quality*, as applicable;
- provide an overview of how surface water will be addressed in the closure plans for the mine;
- include a description of potential cumulative and residual effects of the overall Project on surface water resources and their significance; and
- assess predicted wastewater effluent quality in relation to the requirements of the *Metal Mining Effluent Regulations (MMER)* of the *Fisheries Act*. The assessment should detail how proposed effluent is predicted to mix in the receiving environment for effluents discharged from the Project.

In conducting the analysis, the Proponent should consider pertinent acts, policies, guidelines and directives relating to surface water quality and quantity. The EIS must describe technically and economically feasible measures to mitigate effects to surface water quality and quantity and predict adverse residual effects and their significance. The EIS should also address what measures would be taken by the Proponent if water quality or quantity were to be affected by the Project.

4.19 Wetlands

The effects of the Project on wetlands must be assessed within the Project footprint and for areas that could be reasonably expected to be affected by the Project. Boundaries for assessing the cumulative

effects of the Project in combination with other projects and activities that have been or will be carried out will generally be different from (larger than) the boundaries for assessing the effects of the Project.

4.19.1 VEC Definition and Rationale for Selection

Wetlands are defined as lands having the water table at, near, or above ground surface, or are saturated long enough to promote wetland aquatic processes (i.e., bogs, fens, marshes, swamps, shallow water), as indicated by wet soils, hydrophilic vegetation and various kinds of biological activity that are adapted to wetland environments (NL *Water Resources Act*).

Wetlands help maintain ecological integrity and contribute to ecological, hydrologic (water quantity), biochemical (water quality) and habitat (as habitat for waterfowl, fish and other wildlife) functions and processes.

4.19.2 Potential Project-VEC Interactions

Wetlands may be affected by Project activities associated with the mine and infrastructure associated with the Project that will result in clearing of or disturbance to natural vegetation, or ground disturbance (e.g., grubbing, grading, and excavation).

Potential Project-VEC interactions include:

- alteration or loss of wetland quantity due to vegetation clearing, infilling, heavy equipment use and other vehicle traffic;
- alteration of wetland quality (including ecosystem integrity and ability to function) due to changes in surface water hydrology, such as ponding or surface water diversion; and
- alteration of surface water and/or groundwater quality resulting from construction and/or operation (e.g. siltation, effluent discharge, spills) and subsequent indirect effects to plant communities.

4.19.3 Existing Environment

Wetlands that may be affected by Project activities must be characterized according to their location, size, type (wetland class and form), species composition and ecological function.

Wetlands within the Project areas will be classified according to the *Canadian Wetland Classification System* (CWCS) (National Wetlands Working Group [NWWG] 1997). Efforts should focus on collection

of data for wetlands with the greatest potential to be affected (i.e., within the Project footprint), while collecting data at the appropriate scale for regional comparisons.

An overview of the key plant communities and animals that rely on wetlands must be presented.

4.19.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on wetlands must be assessed for all phases of the Project, as well as accidental events. Wetland alteration is defined as changes to the wetland class or form, or changes to the performance of wetland functions resulting from disturbance to vegetation, soils, or hydrology. Wetland loss is defined as conversion of wetland to non-wetland (e.g., upland, lake, pond or watercourse) due to infilling, excavation or alteration to the hydrology. Wetland loss and wetland alteration must be assessed within the context of wetland supply and wetland function.

The EIS must describe the technically and economically feasible measures that will be applied to mitigate effects on wetlands and predict residual adverse effects and their significance. Proposed mitigation should be consistent with the provincial policy directive, *Policy for Development in Wetlands*. The EIS should provide justification for situations where avoidance of wetlands is not possible.

The EIS must assess the potential effects of accidents and malfunctions during the construction and operations phases of the Project to wetlands (e.g., fuel spills).

In conducting the analysis, the EIS should consider pertinent federal, provincial, municipal and local acts, policies, guidelines and directives relating to Wetlands.

Further guidance related to the assessment of effects to wetlands can be found in the Environment Canada publication *Wetland Ecological Functions Assessment: An Overview of Approaches* (Hanson *et al*., 2008) and in *Wetland Mitigation in Canada: A Framework for Application* (Cox and Grose, 2000).

4.20 Birds, Other Wildlife and Their Habitats

The effects of the Project on birds, other wildlife and their habitats will be assessed within the Project footprint (i.e., cleared areas) and areas that could reasonably be affected by the Project activities. Boundaries for assessing the cumulative effects of the Project in combination with other projects and

activities that have been or will be carried out will generally be different from (larger than) the boundaries for assessing the effects of the Project.

4.20.1 VEC Definition and Rationale for Selection

Birds, other wildlife and their habitat refers to migratory and non-migratory species that are potentially feeding, breeding, moving and/or migrating through the Project area. Species and other ecosystem components are important to local residents, regional stakeholders, and regulatory authorities (i.e., municipal, provincial and federal) for recreation, economic, cultural and/or management considerations.

4.20.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- habitat loss or degradation due to construction and operation of Project facilities and associated infrastructure;
- effects on the physical condition of individuals due to emissions/discharges from the Project;
- mortality and loss of productivity due to construction, operation and/or decommissioning and/or accidents and malfunctions during these Project phases; and
- disruption of feeding, breeding, movement and/or migratory patterns due to noise, lights and/or presence of Project facilities.
- habitat loss or degradation, disruption of feeding, breeding, movement and/or migratory patterns due to habitat fragmentation and opening of new access to humans (hunting and gathering, recreation).

4.20.3 Existing Environment

The EIS must describe avifauna, migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other landbirds), ungulates, furbearers, amphibians, small mammals, and their habitat at the Project site and within the local and regional areas. The results of any baseline surveys must be included.

4.20.3.1 Migratory Birds

Migratory birds are protected under the *Migratory Birds Convention Act* (MBCA) and associated regulations. Birds protected under the Migratory Birds Convention Act are specifically named in the

Environment Canada publication, *"Birds Protected in Canada under the Migratory Birds Convention Act, Canadian Wildlife Service Occasional Paper No. 1."* Preliminary data from existing sources should be gathered on year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, fall migration). In addition to information obtained from the Atlantic Canada Conservation Data Centre (ACCDC) and naturalists, other relevant datasets should be consulted, such as those available from:

- Bird Studies Canada's "Nature Counts" web portal (http://www.birdscanada.org/birdmon/default/datasets.jsp);
- the *Quebec Breeding Bird Atlas 1984-89* (*Les oiseaux nicheurs du Québec: atlas des oiseaux nicheurs du Québec méridional)*. A copy of this atlas is available at: http://www.atlas-oiseaux.qc.ca/1eratlas_en.jsp; and
- other data and projects, based on consultation with government and other agencies.

Existing data should be supplemented by surveys, where necessary. Surveys should be designed with reference to the Canadian Wildlife Service's Technical Report No. 508, *A Framework for the Scientific Assessment of Potential Project Impacts on Birds* (Hanson *et al*. 2010). Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing effects on migratory birds. Survey protocols for migratory birds should be reviewed by EC-CWS prior to implementation.

4.20.3.2 Other Wildlife

Other wildlife includes:

- Amphibians (primarily spring peepers) and small mammals;
- Non-migratory birds;
- Ungulates include boreal sedentary or migratory caribou populations in the region, and moose; and
- Furbearers refer to species such as black bear, wolf, marten, red fox, beaver and otter.

Other wildlife and their habitat that could be affected by Project activities must be characterized using existing data, supplemented by surveys as appropriate, e.g., targeted spring surveys for spring peepers. The Proponent should contact FLR for further detail on the information requirements.

The EIS should give particular consideration to areas of concentration of migratory animals, such as breeding, denning and/or wintering areas, as well as breeding areas of species low in number and high in the food chain (e.g., furbearers such as black bear and wolf).

4.20.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on birds, other wildlife and their habitats should be assessed for all phases of the Project, and for malfunctions and accidental events. The EIS shall present an analysis of the Project's effects on habitats, giving consideration to, and demonstrating linkages to predicted physical and biological changes resulting from the Project. Management tools (i.e., federal and provincial laws and policies, guidance, and provincial or regional strategies and plans) applicable to the protection of wildlife and/or wildlife habitat must be considered in the EIS. The EIS must:

- quantify and describe overall loss or alteration of terrestrial habitat that could result from the Project and its effect on key species. Where possible, rank habitat quality for each VEC species so that the loss of high-quality habitat can be assessed in the context of its regional availability. Regional boundaries for assessment of relative habitat loss should be based on major watershed boundaries and eco-sections;
- assess the Project's potential effects on wildlife behaviour, such as feeding, breeding, migration and movement, with respect to:
    - physical hazards and attractants for wildlife (e.g., roads, pits, and other structural features),
    - chemical hazards and attractants for wildlife (e.g., identified contaminants of potential concern), and
    - sensory disturbance causing wildlife attraction or deterrence (e.g., noise, light, and human presence;
- assess the potential effects on species known to be important to Indigenous governments and organizations.

The EIS must describe technically and economically feasible measures to mitigate effects on birds, other wildlife, and their habitats and predict adverse residual effects and their significance. This includes plans and predictions for rehabilitation of the Project area, taking into account growth rates of local vegetation.

4.21 Species at Risk and Species of Conservation Concern

The effects of the Project on animal and plant Species at Risk (SARs) and species of special conservation concern (rare species) will be assessed within the Project footprint (i.e., cleared areas) and areas that could reasonably be affected by the Project activities. Boundaries for assessing the cumulative effects of

the Project in combination with other projects and activities that have been or will be carried out will generally be different from (larger than) the boundaries for assessing the effects of the Project.

4.21.1 VEC Definition and Rationale for Selection

SARs include:

- species that are listed under the federal *Species at Risk Act* (SARA) and relevant provincial legislation such as the NL *Endangered Species Act* (ESA);
- species recommended for legal listing by COSEWIC and/or the NL Species Status Advisory Committee (SSAC), and;
- species ranked by the Atlantic Canada Conservation Data Centre (ACCDC) as S1, S2, or S3 or general status (NL Fisheries and Land Resources – Wildlife Division General Status of Wildlife Ranks) as may be at risk or undetermined.

Preservation of SARs and species of conservation concern is important for maintaining ecological integrity and species biodiversity. There are also legislative and policy requirements to protect SARs and their habitats and prevent species from becoming at risk. Any measures undertaken to mitigate and monitor effects must be consistent with applicable federal recovery strategies, federal action plans, and/or provincial recovery/management plans.

4.21.2 Potential Project-VEC Interactions

Potential Project-VEC interactions for SARs and species of conservation concern include:

- habitat loss or degradation due to construction and operation of Project facilities and associated infrastructure;
- effects on the physical condition of individuals due to emissions/discharges from the Project;
- mortality and loss of productivity associated with construction, operation and/or decommissioning and/or accidents and malfunctions during all Project phases; and
- disruption of feeding, breeding, movement and/or migratory patterns due to noise, lights and/or presence of Project facilities.
- habitat loss or degradation, disruption of feeding, breeding, movement and/or migratory patterns due to habitat fragmentation and opening of new access to humans (hunting and gathering, recreation).

Project activities that will result in clearing of or disturbance to natural vegetation, or ground disturbance (e.g., grubbing, grading, and excavation) may affect rare plant species by:

- altering or destroying individual rare plants, or habitat capable of supporting rare plant species;
- altering preferred habitat due to changes in surface water hydrology (e.g., ponding, surface water runoff patterns);
- destroying plants, or reducing health conditions of individuals and /or their habitat due to soil erosion, structural soil changes, or soil contamination; and/or
- displacing rare plants due to non-native and invasive species introduction.

4.21.3 Existing Environment

As background for the analysis of the Project's effects on SARs and species of conservation concern, the EIS must:

- identify all SARs and species of conservation concern that may be affected by the Project, using existing data and literature as well as surveys to provide current field data, as appropriate;
- provide assessments of regional importance, abundance and distribution that optimize the ability to detect all species at risk and sufficient survey effort to obtain comprehensive coverage; and
- identify residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of SARs and species of conservation concern that may occur in the Project area, or be affected by the Project.

The following information sources on species at risk and species of conservation concern should be consulted:

- *Species at Risk Act* (SARA (www.sararegistry.gc.ca));
- Newfoundland and Labrador *Endangered Species Act* (NLESA);
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Species Status Advisory Committee (SSAC);
- Department of Fisheries and Land Resources (FLR) – Wildlife Division General Status of Wildlife Ranks;
- Atlantic Canada Conservation Data Centre (ACCDC);
- Relevant Government agencies;
- Local naturalist/interest groups and/or residents; and
- Appropriate Indigenous governments and organizations.

4.21.4 Effects Assessment and Mitigation

The EIS should identify the adverse effects of the Project on SARs and species of conservation concern, including individuals, critical habitat, recovery habitat, important habitat, and residences of species listed under SARA and the NLESA, species recommended for legal listing by COSEWIC, the SSAC, as well as adverse effects on species of conservation concern ranked by the ACCDC as S1, S2, or S3.

The EIS should describe specific measures that will be taken to avoid or reduce adverse effects and to monitor them (consistent with any applicable federal recovery strategy, federal action plans, and/or provincial recovery/management plan). The effects analysis must include project-specific effects and cumulative effects on SARs and their critical habitat, recovery habitat, important habitat, and/or residences. The likely significance of the Project's potential adverse environmental effects on SARs and species of conservation concern must be predicted.

Analysis must take into account pertinent acts, policies, guidelines and directives relating to species at risk, such as:

- *Newfoundland and Labrador: A Provincial Policy Regarding the Conservation of Species at Risk.*
- *Newfoundland and Labrador Endangered Species Act* (NLESA)

4.22 Current and Future Use of Lands and Resources

The effects of the Project on current and future use of lands and resources will be assessed within the Project property boundaries, and along the right-of-way of associated infrastructure.

4.22.1 VEC Definition and Rationale for Selection

Current use of lands and resources is defined as use of land and resources, including industrial uses, within the Project property boundaries and along the right-of-way of associated infrastructure. It was selected as a VEC due to its socio-economic importance.

4.22.2 Potential Project-VEC Interactions

Potential Project-VEC interactions will result from construction and operation activities that alter or destroy wildlife and fish habitat, contaminate country foods, contaminate drinking water supplies, result

in restricted access, or modify the existing use of the Project area as a result of diminished air quality, changes to viewscapes, noise and other disturbances.

4.22.3 Existing Environment

The EIS must describe land use at the Project site and within the regional areas. It should identify past, current and any known planned land use(s) of the Project area that may be affected by the Project. Local land and resource users should be consulted to help characterize existing land and resource use patterns. The aspects listed below are to be considered to the extent that they are applicable to the site:

- **Residential and Recreational Property**: The EIS must identify any property whose value may be adversely affected by any change in the environment caused by the Project. The occurrence of houses and cabins in the vicinity of the proposed mine site should be described, as well as any land identified for potential housing development. The discussion should include any effects of the Project to local residents (e.g., dust on clothes hanging on clotheslines, noise, aesthetic changes);
- **Outdoor Recreation and Tourism**: A baseline study of the current access and use of the mine site and surrounding areas for recreation and the tourist industry (e.g., berry picking, plant harvesting, recreational fishing, hiking, mountain biking, trail running, snowshoeing, snowmobiling and snowmobile trails, alpine/Nordic skiing, parks, camping, recreational use of water bodies must be provided);
- **Hunting, Trapping and Guiding**: the current and projected value of the hunting, trapping and guiding industry close to or within the mine site must be provided;
- **Forestry:** The current forest resources and activities at the mine site should be identified;
- **Mineral Exploration:** The current mineral resources and exploration activities in the mine area must be identified;
- **Agriculture:** The EIS must identify current agricultural resources and activities, if any, that could be affected by the mine;
- **Navigation:** The EIS should provide an overview of the current and past navigational use in waters that could be affected in the Project area;
- **St. Lewis Wharf:** The EIS should describe the current use of the local wharf;
- **Sea Planes:** The EIS should describe current use of local lakes; and
- **Communication Towers:** The EIS should describe any potential effects to communications towers.

4.22.4 Effects Assessment and Mitigation

The EIS must describe the adverse effects, including effects of potential malfunctions and accidental events on existing and planned land and water uses, including the components identified in the previous section, that may arise from changes in the environment caused by the Project (e.g., noise/vibrations, air and water quality, visual and topographic characteristics of the area). The discussion should include consideration of:

- increased industrialization and changes to the visual landscapes for local communities, surrounding areas and along provincial roads and highways; and
- the effects of noise, dust and visual effects to recreation, including along access roads.

The analysis should take into consideration pertinent legislation, policies, guidelines and directives relating to land and resource use. The EIS must describe technically and economically feasible measures that would be employed to mitigate effects on current use of lands and resources, as well as predicted adverse residual effects, including cumulative effects, and their significance.

4.23 Community Services and Infrastructure

The effects of the Project on the community services and infrastructure of the Town of St. Lewis and any other affected community (in accordance with Newfoundland and Labrador requirements) will be assessed.

4.23.1 VEC Definition and Rationale for Selection

Community Services and Infrastructure includes:

- employment and social services;
- health services and social programs;
- training and education services and programs;
- safety and security;
- housing and accommodation (residential and tourist);
- municipal administrative capacity;
- recreational services (e.g. walking trails);
- the residential diesel power generation plant, transmission lines and other infrastructure;
- municipal services and infrastructure; and

- transportation infrastructure.

The listed services and infrastructure are important to area residents and their availability may be reduced due to the Project.

4.23.2 Potential Project-VEC Interactions

The interaction of the Project with community services and infrastructure is related to the Project's labour force. Project employment related effects will likely incur demographic change, and a subsequent increase in demand on services and infrastructure.

4.23.3 Existing Environment

Baseline conditions for population demographics and labour force, as well as existing community services and infrastructure, including housing and accommodations must be defined through a review of information from the Government of Newfoundland and Labrador and other relevant agencies and organizations (e.g., municipalities, Indigenous governments and organizations, emergency service providers and tourism and accommodation agencies). Where additional information is required, field surveys and/or interviews with local individuals shall be conducted. In establishing the baseline for community services and infrastructure, particular attention should be paid to the capacity to handle any Project-induced increase in demand. Information relative to expected lifespan of infrastructure such as roads, water and sewer distribution and treatment facilities should be included in those baseline studies.

4.23.4 Effects Assessment and Mitigation

The EIS must describe:

- the existing inventory of infrastructure for both men and women in the community;
- the effects of Project-related demand on community services and infrastructure, including water and sewage treatment;
- plans for electrical power requirements for the Project and the impact on existing infrastructure and residents;
- the potential traffic increase due to the Project, and associated health and safety implications;
- assess the decrease in lifespan of physical infrastructure based on increased use that can be attributed to the project and its spinoffs;

- quantify the value of any lost lifespan for infrastructure as a factor of overall replacement cost of that infrastructure (e.g., if a road has an estimated 10 years of wear remaining before it must be re-constructed, and the project will reduce the lifespan of that road to 8 years, there should be quantification of the value of the lost two years of road use);
- potential increase in passenger and freight traffic through the Happy Valley-Goose Bay Airport due to the Project and potential to effect airfares;
- potential increase in passenger and freight traffic on ferry services across the Strait of Belle Isle;
- plans for supplying worker accommodations during construction and operation of the Project, including consideration of accommodations for supporting contractors and potential for supplying low-income and senior housing; and
- the potential for blasting from the Project to effect municipal and/or residential infrastructure.

The EIS must describe technically and economically feasible measures to mitigate effects on community services and infrastructure for both the construction and operation phases, as well as predicted adverse residual effects and their significance. That Plan should reduce, to the extent possible, acceleration of the effective lifespan of infrastructure. This should include specific consideration of mitigation to prevent displacement of current residents by Project employees/contractors from existing accommodations. Safety zones established in relation to Project blasting should be described.

Pertinent acts, policies, guidelines and directives relating to community services and infrastructure must be considered, including the Municipal Plans of the Town of St. Lewis if one exists.

4.24 Health and Community Health

The effects of the Project on the health of nearby human receptors including nearby cabin/cottage users and community health in St. Lewis and Port Hope Simpson will be assessed.

4.24.1 VEC Definition and Rationale for Selection

Health and Community Health includes human health, wellness and family life. Human health includes perceptions related to quality of life.

4.24.2 Potential Project-VEC Interactions

Individual and community health may be affected by environmental changes caused by the Project (e.g., dust, noise, light, recreational land use and/or aesthetic changes).

4.24.3 Existing Environment

Baseline conditions for applicable measures of health and community health must be defined through a review of information from the Government of Newfoundland and Labrador and other relevant agencies and organizations. Where additional information is required, studies and/or interviews with local individuals shall be conducted.

4.24.4 Effects Assessment and Mitigation

The EIS should describe and evaluate changes to human health and well-being (e.g., physical and mental health) that may occur as a result of Project-related effects to the environment, including concern about potential changes to the quality of life as a result of the Project. This discussion should include consideration of the following:

- characterization of all possible sources of contaminants/emissions, exposure pathways and consumption patterns that may generate health effects (e.g., respiratory concerns for sensitive components of the population), if any;
- the potential for health effects that may arise from changes in water quality and quantity;
- the potential for health effects that may arise from noise or vibrations;
- the effects of the Project on the health and safety of Project workers, and those working in the areas affected by the Project, including the possible effects of any accidents or spills;
- effects of the Project on social factors such as substance abuse and crime rates; and
- implications of the Project on residents' perceptions of quality of life (e.g., from changes in recreational patterns and country foods consumption, light, noise, changes in landscape etc.).

The EIS must describe technically and economically feasible measures to mitigate effects to Health and Community Health for both the construction and operation phases and predict the potential for adverse residual effects and their significance. Safety zone established in relation to Project blasting should be described. Pertinent acts, policies, guidelines and directives relating to health must be considered.

4.25 Economy, Employment and Business

The effects of the Project on economy, employment and business will be assessed at the local and provincial scales, in accordance with Newfoundland and Labrador requirements.

4.25.1 VEC Definition and Rationale for Selection

Economy, employment and business is defined as:

- economy of southeast Labrador, Labrador and the rest of the Province;
- taxes and royalties;
- gross domestic product (GDP);
- employment in southeast Labrador, Labrador and in the rest of the Province;
- skilled and unskilled labour supply in southeast Labrador, Labrador and the rest of the Province;
- expenditures in southeast Labrador, Labrador and the rest of the Province;
- employment equity and diversity including under-represented groups;
- business capacity: goods and services; and
- economic activities related to tourism.

Understanding the Project's effects on economy, employment and business is fundamental to assessing socio-economic implications for the lives of residents and of revenues to governments.

4.25.2 Potential Project-VEC Interactions

The interaction of the Project with economy, employment and business is related to the Project's expenditures, employment, and environmental effects.

4.25.3 Existing Environment

Baseline conditions for the economy, employment and business at a regional level will be determined through a review of information available from the Government of Newfoundland and Labrador and other relevant agencies and organizations (e.g., Statistics Canada 2006 census) within Economic Development Zone 4 and potentially affected Indigenous organizations. Where additional information is required, studies and/or interviews shall be conducted.

Baseline conditions will be characterized for:

- existing employment (e.g., by sector) and income conditions;
- skilled and unskilled labour supply;

- employment equity and diversity including potentially under-represented groups;
- GDP for Newfoundland and Labrador;
- income levels;
- sources of income;
- labour force indicators including labour force, employment, unemployment and employment, unemployment and participation rates;
- business and industry profile (including industries of specific importance such as mineral exploration and mining); and
- tourism related activities.

4.25.4 Effects Assessment and Mitigation

The EIS must assess the Project-related effects on economic, employment and business conditions and opportunities, as described in the above sections, focusing on Economic Development Zone 4 and potentially affected Indigenous communities. The discussion should describe proposed grants or other benefits which could accrue to local towns/municipalities as a result of the Project.

It is understood that employment opportunities will be realized during the construction and development phases of the Project, possibly through contracts to third parties. The EIS must provide:

- a clear and accurate description of labour force requirements for both construction and operation phases for the Project (including for third party contracts);
- expected effects on the local labour force in southeast Labrador and Labrador, by gender; and
- technically and economically feasible measures to mitigate adverse effects, and to optimize beneficial effects.

The EIS should describe potential effects to tourism activities in local municipalities.

With any construction and operation of the mineral development, economic benefits to the local municipalities should be identified. The EIS must provide:

- a description of any economic benefit to the region e.g. a procurement plan; and
- expected impact on the economy of the region.

The EIS must include statements by the operator indicating their acknowledgement that the following documents must be finalized prior to the granting of EA release:

- A Gender Equity and Diversity Plan that meets the approval of the Minster of Natural Resources and the Minister Responsible for the Status of Women. The plan must include an employment plan and a business access strategy historically underrepresented groups, including Indigenous peoples, women, persons with disabilities and visible minorities. These plans will document the Proponent's strategy to maximize participation for members of these groups in the development of the Project; and

- A Newfoundland and Labrador Benefits Plan that meets the approval of the Minister of Natural Resources.

Pertinent acts, policies, guidelines and directives relating to economy, employment and business must be taken into account.

4.26 Commitments made in the EIS

The EIS should provide a list of all commitments made regarding environmental mitigation, monitoring and follow-up. Each commitment must be cross-referenced to the section of the EIS where it has been made.

Data and Information Sources

Canada Transportation Act: http://laws.justice.gc.ca/eng/acts/C-10.4/index.html

Canadian Environmental Assessment Agency. 1992. *Canadian Environmental Assessment Act* and Regulations. http://laws-lois.justice.gc.ca/eng/acts/C-15.2/

Canadian Environmental Assessment Agency. 1996. *Reference Guide on Physical and Cultural Heritage Resources*. http://www.ceaa.gc.ca/default.asp?lang=En&n=1BE75513-1

Canadian Environmental Assessment Agency. 2003. *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*. http://ceaa.gc.ca/default.asp?lang=En&n=DACB19EE-1

Cox, K. and Grose, A., 2000. *Wetland Mitigation in Canada: A Framework for Application.* Sustaining Wetlands Issues paper, No, 2000-1. Published in partnership with Ontario Ministry of Natural Resources, Environment Canada, Ducks Unlimited Canada, and the Joint Ventures of the North American Waterfowl Management Plan, North American Wetlands Conservation Council Canada, Ottawa, Ontario. http://www.wetlandscanada.org/Wetland%20Mitigation%202000-1.pdf

Environment Canada – Parks Canada. 2010. *The Species at Risk Act Environmental Assessment Checklists for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada – Support Tool for the Required Information Elements Under the Species at Risk Act for Environmental Assessments Conducted Under the Canadian Environmental Assessment Act*: http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=DA30C3BC-F7ED-45F2-868B-17A0B33B6FDF

Environment Canada, 1991. Birds Protected in Canada under the Migratory Birds Convention Act, Canadian Wildlife Service Occasional Paper No. 1.

http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=97AC4B68-69E6-4E12-A85D-509F5B571564

Environment Canada. 2004. Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada. First Edition, Canadian Wildlife Service, Environment Canada. 68 Pages.

Environment Canada. 2008. Environment Canada Guidance Related to the Environmental Assessment of Aggregate Pit Mines and Quarries in the Atlantic Provinces. 13 Pages.

Environment Canada. Sept 2003 (updated: March, 2004). Implementation Guidelines for Part 8 of the Canadian Environmental Protection Act, 1999 - Environmental Emergency Plans. 58 pages. http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=D6ADAD2D-1

Environment of Canada. 1991. The Federal Policy on Wetland Conservation. Canadian Wildlife Services, Environment Canada, Ottawa, Ontario. 15 pages. http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=BBAAE735-EF0D-4F0B-87B7-768745600AE8

Explosives Act: http://laws.justice.gc.ca/eng/acts/E-17/index.html

DFO - Projects Near Water website http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html for information related to advice on mitigations to protect fisheries and the process to obtaining a Fisheries Act Authorization

Government of Canada. 2003. *A Framework for the Application of Precaution in Science-based Decision Making About Risk.*

Guidelines for Canadian Drinking Water Quality. 1996. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2010-sum_guide-res_recom/index-eng.php

Hanson, A., I. Goudie, A. Lang, C. Gjerdrum, R. Cotter and G. Donaldson. 2009. *A Framework for the Scientific Assessment of Potential Project Impacts on Birds*. Canadian Wildlife Service's Technical Report Series No. 508. Atlantic Region. 61 pp.

Hanson, A., L. Swanson, D. Ewing, G. Grabas, S. Meye, L. Ross, M. Watmough, and J, Kirby. 2008. *Wetland Ecological Functions Assessment: An Overview of Approaches*. Canadian Wildlife Service Technical Report Series No. 497. Atlantic Region. 59 pp. http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=B8737F25-B456-40ED-97E8-DF73C70236A4

Health Canada. 2010. *Useful Information for Environmental Assessments*. Ottawa, Ontario. 17 pages. http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/environ_assess-eval/index-eng.php

Health Canada. 2017. Evaluating Human Health Impacts in Environmental Assessment: Noise. Ottawa, Ontario. https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-noise.html

Health Canada. 2017. Evaluating Human Health Impacts in Environmental Assessment: Air Quality. Ottawa, Ontario. https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-air-quality.html

Health Canada. 2017. Evaluating Human Health Impacts in Environmental Assessment: Water Quality. Ottawa, Ontario. https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-water-quality.html

Health Canada. 2017. Evaluating Human Health Impacts in Environmental Assessment: Radiological Impacts. Ottawa, Ontario. https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-radiological.html

Minister of the Department of Indian Affairs and Northern Development. March 2011. *Aboriginal Consultation and Accommodation - Updated Guidelines for Federal Officials to Fulfill the Duty to Consult*. http://www.ainc-inac.gc.ca/eng/1100100014664

Municipal Plan for the Town of Labrador City, 2007-2017. http://www.labradorwest.com/modules/Documents/documents/Labrador%20City%20Municipal%20Plan%202007%202017%20August%2029%202007.pdf

National Wetlands Working Group (NWWG). 1997. *The Canadian Wetland Classification System, second edition*, B.G. Warner and C.D.A. Rubec (ed.). Wetlands Research Centre, University of Waterloo, Waterloo. 68 p.

Navigable Waters Protection Act: http://laws.justice.gc.ca/eng/acts/N-22/

Newfoundland and Labrador Department of Municipal Affairs and Environment. *Guidance for Plume Dispersion Modeling* (GD-PPD-019.1).

Newfoundland and Labrador Department of Municipal Affairs and Environment. *Determination of Compliance with the Ambient Air Quality Standards (*GD-PPD-009.3*)*.

Newfoundland and Labrador *Endangered Species Act*: http://assembly.nl.ca/Legislation/sr/statutes/e10-1.htm

Newfoundland and Labrador *Environmental Protection Act*: http://assembly.nl.ca/Legislation/sr/statutes/e14-2.htm#58_

Newfoundland and Labrador *Historic Resources Act*: http://assembly.nl.ca/Legislation/sr/statutes/h04.htm

Newfoundland and Labrador *Mineral Act*: http://assembly.nl.ca/Legislation/sr/statutes/m12.htm

Newfoundland and Labrador *Municipalities Act, 1999*:
http://assembly.nl.ca/Legislation/sr/statutes/m24.htm

Newfoundland and Labrador *Urban and Rural Planning Act, 2000* :
http://assembly.nl.ca/Legislation/sr/statutes/u08.htm

Newfoundland and Labrador *Sustainable Development Act*: (to be proclaimed)
http://assembly.nl.ca/Legislation/sr/statutes/s34.htm

Newfoundland and Labrador *Water Resources Act*:
http://assembly.nl.ca/Legislation/sr/statutes/w04-01.htm

Ramsar Convention Secretariat. 2006. The Ramsar Convention Manual, 4th edition. *A Guide to the Convention on Wetlands*. http://www.ramsar.org/pdf/lib/lib_manual2006e.pdf

SARA-CEAA Guidance Working Group (Canada). 2010. *Addressing Species at Risk Act considerations under the Canadian Environmental Assessment Act for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada*. http://www.registrelep-sararegistry.gc.ca/document/dspDocument_e.cfm?documentID=2100

The Government of Newfoundland and Labrador's Aboriginal Consultation Policy on Land and Resource Development Decisions ("The Policy") April 2013
http://www.exec.gov.nl.ca/exec/igas/publications/aboriginal_consultation.pdf

The Government of Newfoundland and Labrador's Policy for Development in Wetlands, 2001
http://www.env.gov.nl.ca/env/waterres/regulations/policies/wetlands.html

Appendix A: Public Notices

Under the provisions of the *Environmental Assessment Regulations 2003*, Section 10 and where the approved Guidelines require public information session(s), the following specified public notification requirements must be met by the Proponent prior to each meeting:

Public Notice

Public Information Session on the Proposed

Name of undertaking

Location of undertaking

Shall be held at

Date and Time

Location

This session shall be conducted by the Proponent,

Proponent name and contact phone number,

as part of the environmental assessment for this Project,

to describe the activities associated with and to provide an opportunity for all interested persons to request information or state their concerns.

ALL ARE WELCOME

Minimum information content of public advertisement - (Proponent to substitute appropriate information for italicized items).

Minimum newspaper ad size: 2 column widths.

Minimum posted ad size: 7" x 5"

Minimum newspaper ad coverage: Weekend preceding meeting and 3 consecutive days prior to meeting date; to be run in newspaper locally distributed within meeting area or newspaper with closest local distribution area.

Minimum posted ad coverage: Local Town or City Hall or Office and local Post Office, within town or city where meeting is held, to be posted continually for 1 full week prior to meeting date.

The proponent is advised to consult with the Environmental Assessment Division regarding other more appropriate means for the Public Notice such as local radio stations or social media. Any deviation from these requirements for any reason must receive prior written approval of the Minister of Municipal Affairs and Environment.