

Issued by:

NUNAVUT IMPACT REVIEW BOARD

P.O. Box 1360

29 Mitik Street

Cambridge Bay, NU X0B 0C0

Telephone: 1-866-233-3033

Fax: 1-867-983-2594

E-mail: info@nirb.ca

Website: www.nirb.ca

DRAFT

TABLE OF CONTENTS

TABLE OF CONTENTS.....	1
PART I – THE ASSESSMENT.....	7
1.0 Introduction.....	7
2.0 Guiding Principles	7
2.1 The NIRB’s Impact Review Principles	7
2.2 Public Participation.....	8
2.3 Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge.....	9
2.4 Precautionary Principle.....	9
2.5 Sustainable Development	10
3.0 Scope of the NIRB Assessment.....	11
4.0 Preparation and Review of the Environmental Impact Statement.....	11
4.1 Guidance.....	11
4.2 Study Strategy and Methodology	12
4.3 Use of Existing Information	13
PART II – THE ENVIRONMENTAL IMPACT STATEMENT	14
5.0 Guidance on the Content and Presentation of the Environmental Impact Statement.....	14
5.1 Content.....	14
5.2 Concordance Table	14
5.3 Presentation.....	15
5.4 Translation	15
5.5 Main Document of the Environmental Impact Statement	15
5.6 Summaries	16
5.6.1 Executive Summary.....	16
5.6.2 Popular Summary.....	17
6.0 Introductory Sections of the Environmental Impact Statement.....	17
6.1 Project Overview	17
6.2 Project Location.....	17
6.2.1 Land Tenure	18
6.3 Proponent Information.....	19
6.4 Regulatory Regime	20
6.5 Regional Context	20
7.0 Project Components and Activities	20
7.1 Project Design.....	20
7.2 Analysis of Need and Purpose.....	21
7.3 Scope of the Project.....	22
7.3.1 Detailed Project Proposal Description	22
7.3.2 Project Phases	23
7.3.2.1 Construction	23
7.3.2.2 Operation and Maintenance	25
7.3.2.3 Closure	26
7.4 Future Development	26

7.5	Alternatives.....	27
7.6	Economic and Employment Information.....	28
8.0	Impact Assessment Methodology.....	28
8.1	Scope of the Environmental Assessment.....	28
8.1.1	Factors to be considered.....	28
8.1.2	Scope of Factors.....	30
8.1.2.1	Valued Ecosystem and Socio-economic Components.....	30
8.1.2.2	Assessment Boundaries.....	32
8.2	Public Consultation.....	34
8.3	Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge.....	35
8.4	Description of the Environment and Baseline Information.....	36
8.5	Study Strategy and Methodology.....	36
8.5.1	Acquisition Methodology and Documentation.....	37
8.5.2	Data Analysis and Presentation.....	37
8.6	Impact Assessment Approach.....	37
8.6.1	Impact Prediction.....	38
8.6.2	Impacts of the Environment on the Project.....	38
8.6.3	Cumulative Effects Assessment.....	40
8.6.4	Transboundary Impacts.....	41
8.6.5	Indicators and Criteria.....	41
8.6.6	Significance Determination.....	42
8.6.7	Certainty.....	43
9.0	Project Environment and Impact Assessment.....	43
9.1	Biophysical Environment and Impact Assessment.....	43
9.1.1	Air Quality.....	44
9.1.1.1	Baseline Information.....	44
9.1.1.2	Impact Assessment.....	44
9.1.2	Climate and Meteorology, including Climate Change.....	44
9.1.2.1	Baseline Information.....	44
9.1.2.2	Impact Assessment.....	45
9.1.3	Noise and Vibration.....	45
9.1.3.1	Baseline Information.....	45
9.1.3.2	Impact Assessment.....	45
9.1.4	Terrestrial Environment.....	46
9.1.4.1	Baseline Information.....	46
9.1.4.2	Impact Assessment.....	46
9.1.5	Geological Features, Surficial and Bedrock Geology and Geochemistry.....	47
9.1.5.1	Baseline Information.....	47
9.1.5.2	Impact Assessment.....	47
9.1.6	Hydrological Features and Hydrogeology.....	48
9.1.6.1	Baseline Information.....	48

9.1.6.2	Impact Assessment.....	49
9.1.7	Groundwater and Surface Water Quality.....	49
9.1.7.1	Baseline Information.....	49
9.1.7.2	Impact Assessment.....	50
9.1.8	Sediment Quality.....	50
9.1.8.1	Baseline Information.....	50
9.1.8.2	Impact Assessment.....	51
9.1.9	Aquatic Environment.....	51
9.1.9.1	Baseline Information.....	51
9.1.9.2	Impact Assessment.....	52
9.1.10	Vegetation.....	53
9.1.10.1	Baseline Information.....	53
9.1.10.2	Impact Assessment.....	54
9.1.11	Terrestrial Wildlife and Wildlife Habitat.....	54
9.1.11.1	Baseline Information.....	54
9.1.11.2	Impact Assessment.....	55
9.1.12	Birds and Bird Habitat.....	57
9.1.12.1	Baseline Information.....	57
9.1.12.2	Impact Assessment.....	57
9.2	Socio-Economic Environment and Impact Assessment.....	58
9.2.1	Economic Development and Opportunities.....	59
9.2.1.1	Baseline Information.....	59
9.2.1.2	Impact Assessment.....	59
9.2.2	Employment.....	59
9.2.2.1	Baseline Information.....	59
9.2.2.2	Impact Assessment.....	60
9.2.3	Education and Training.....	60
9.2.3.1	Baseline Information.....	60
9.2.3.2	Impact Assessment.....	60
9.2.4	Contracting and Business Opportunities.....	61
9.2.4.1	Baseline Information.....	61
9.2.4.2	Impact Assessment.....	61
9.2.5	Population Demographics.....	62
9.2.5.1	Baseline Information.....	62
9.2.5.2	Impact Assessment.....	62
9.2.6	Traditional Activity and Knowledge.....	62
9.2.6.1	Baseline Information.....	62
9.2.6.2	Impact Assessment.....	62

9.2.7	Non-traditional Land and Resource Use.....	63
9.2.7.1	Baseline Information.....	63
9.2.7.2	Impact Assessment.....	63
9.2.8	Heritage Resources.....	64
9.2.8.1	Baseline Information.....	64
9.2.8.2	Impact Assessment.....	64
9.2.9	Health and Wellbeing.....	64
9.2.9.1	Baseline Information.....	64
9.2.9.2	Impact Assessment.....	65
9.2.10	Community Infrastructure and Public Services.....	66
9.2.10.1	Baseline Information.....	66
9.2.10.2	Impact Assessment.....	66
9.2.11	Human Health and Safety.....	67
9.2.11.1	Baseline Information.....	67
9.2.11.2	Impact Assessment.....	67
9.3	Human Health and Environmental Risk Assessment.....	67
9.4	Accident and Malfunctions Assessment.....	68
10.0	Environmental Management System.....	69
10.1	Environmental Management Plan.....	69
10.2	Environmental Protection Plan.....	69
10.3	Monitoring and Mitigation Plans.....	70
10.4	Biophysical Environmental Plans.....	71
10.4.1	Risk Management and Emergency Response Plan.....	71
10.4.2	Fuel Management Plan.....	72
10.4.3	Spill Contingency Plan.....	73
10.4.4	Water Management Plan.....	73
10.4.5	Waste Management Plan.....	74
10.4.6	Hazardous Material Management Plan.....	74
10.4.7	Road Management Plan.....	75
10.4.8	Port Management Plan.....	76
10.4.9	Borrow Pits and Quarry Management Plan.....	77
10.4.10	Explosives Management Plan.....	77
10.4.11	Air Quality Monitoring and Management Plan.....	78
10.4.12	Noise and Vibration Abatement Plan.....	78
10.4.13	Aquatic Effects Management Plan.....	79
10.4.14	Wildlife Mitigation and Monitoring Plan.....	79
10.4.15	No Net Loss Plan.....	80
10.5	Socio-Economic Environmental Plans.....	81
10.5.1	Business Development Plan.....	81
10.5.2	Occupational Health and Safety Plan.....	82
10.5.3	Community Involvement Plan.....	82
10.5.4	Cultural and Heritage Resources Protection Plan.....	83
10.5.5	Human Resources Plan.....	83

10.6	Closure and Reclamation Plan.....	84
10.6.1	Care and Maintenance Plan	86
10.7	Follow-Up and Adaptive Management Plans.....	86
10.8	Significance of Residual Impacts	86
11.0	List of Consultants and Organizations.....	87
12.0	Conclusion	87
	Literature Cited.....	88

List of Appendices

APPENDIX A	<i>DRAFT</i> SCOPE LIST FOR THE GRAYS BAY ROAD AND PORT PROJECT PROPOSAL.....	A
------------	---	---

DRAFT

DEFINITIONS AND TERMS

Refer to the Nunavut Impact Review Board's *Guide 2: Guide to Terminology and Definitions* ([NIRB, 2007](#)) for a complete list of definitions and abbreviations that are based on Nunavut related project proposals and the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* and the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14 s. 2.

LIST OF ACRONYMS

ANFO	Ammonium Nitrate and Fuel Oil
ARD	Acid Rock Drainage
CEA	Cumulative Effects Assessment
COPC	Constituents of Potential Concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Department of Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GN	Government of Nunavut
GN-DOE	Government of Nunavut, Department of Environment
IIBA	Inuit Impact and Benefit Agreement
LSA	Local Study Area
MB	Megabyte
ML	Metal Leaching
NIRB	Nunavut Impact Review Board
NSA	Nunavut Settlement Area
<i>Nunavut Agreement</i>	<i>Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada</i>
<i>NuPPAA</i>	<i>Nunavut Planning and Project Assessment Act</i> , S.C. 2013, c. 14, s. 2
QIA	Qikiqtani Inuit Association
RSA	Regional Study Area
SARA	Species at Risk Act
SEMC	Socio-Economic Monitoring Committee
UTM	Universal Transverse Mercator
VC	Valued Component
VEC	Valued Ecosystem Component
VSEC	Valued Socio-Economic Component

PART I – THE ASSESSMENT

1.0 INTRODUCTION

The purpose of this document is to provide information to the Kitikmeot Inuit Association and the Government of Nunavut (jointly “the Proponent”) about the Nunavut Impact Review Board’s (NIRB or Board) requirements for the preparation of an environmental impact statement (EIS) for the proposed “Grays Bay Road and Port” Project (the Project; NIRB File No.: 17XN011) to be assessed pursuant to the development project review process established under Article 12, Part 5 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (the *Nunavut Agreement*) and Part 3 of the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14, s. 2 (*NuPPAA*). This document specifies the nature, scope, and extent of the information required. Part I of this document provides guidance and general instructions on the preparation of the EIS, and Part II outlines the information that must be included in the EIS.

The text that follows was developed pursuant to Article 12, Section 12.2.23(h) of the *Nunavut Agreement* and s. 26(1)(e) and s. 101 of the *NuPPAA*. The EIS Guidelines are intended to meet the objectives of Article 12, Section 12.5.2 of the *Nunavut Agreement* and s. 101(3) of the *NuPPAA*.

The NIRB relies on the Proponent’s EIS and information provided by Intervenors, the public and affected communities during the review process to inform the Report provided by the NIRB to the responsible Minister(s) when the Board’s Review is completed. The EIS must, therefore, provide the Board with a full description of the ecosystemic and socio-economic effects that may result from the Project. The EIS shall also include a list of key mitigation measures that the Proponent proposes to undertake in order to avoid or minimize any adverse environmental effects of the Project. It is the Proponent’s responsibility to provide sufficient data and analysis on potential changes to the environment.

2.0 GUIDING PRINCIPLES

2.1 The NIRB’s Impact Review Principles

In accordance with the NIRB’s primary objectives found in the *Nunavut Agreement* Section 12.2.5 and *NuPPAA* s. 23, the following principles and approaches should be followed in the review process and in the preparation of the EIS:

- An ecosystem-based approach must be considered to ensure that the Review addresses both the direct impacts that the Project will have on the various ecosystem components, as well as the interactions that will occur between components.
- Socio-economic issues including economic development, health, recreation, and other aspects of well-being, must be considered in order to ensure a culturally holistic understanding of the Project’s effects.
- An understanding of past, current, and potential future environmental, economic, and social trends in the region potentially affected by all phases of the Project will enable

comprehensive understanding of potential project impacts, including potential cumulative effects.

- The well-being of residents of Canada outside the Nunavut Settlement Area must be taken into account and transboundary effects must be included.
- The public that may be impacted by the Project must be allowed to participate in the Review (see [Section 2.2](#))
- Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge (see [Section 2.3](#)) must be included.
- A precautionary approach should be taken, particularly where there is uncertainty about potential impacts of the Project (see [Section 2.4](#)).
- As per the principle of sustainable development (see [Section 2.5](#)) and Article 12, Section 12.2.5 of the *Nunavut Agreement* and s. 23(1) of the *NuPPAA*, in reviewing a project the NIRB shall aim to protect and promote the existing and future well-being of the residents and communities of Nunavut.

The NIRB will consider the need for, alternatives to, and alternative means of carrying out the Project in assessing the justification for any significant environmental and socio-economic effects identified, and in formulating its recommendations to the responsible Minister(s). In complying with the specific direction that follows, the Proponent is expected to prepare an EIS that provides sufficient information and evidence in accordance with principles stated above.

2.2 Public Participation

Public participation is a central objective of the NIRB review process. Meaningful public participation requires the Review to address concerns of the general public and Nunavummiut regarding the anticipated or potential environmental effects of the Project. In preparing its EIS, the Proponent is required to engage potentially affected communities, residents, Inuit Organizations, Indigenous groups, and other governments or other organizations, including where relevant, adjacent jurisdictions outside of the Nunavut Settlement Area. The Proponent should refer to the NIRB's *Guide 6b: A Proponent's Guide to Conducting Public Consultation for the NIRB Environmental Assessment Process* ([NIRB, 2006a](#)) when preparing to consult with the general public. Public participation and engagement is required when:

- Identifying current and historical patterns of land and resource use;
- Acquiring Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge;
- Identifying valued ecosystem components and valued socio-economic components;
- Evaluating the significance of potential impacts;
- Deciding upon mitigating measures; and
- Identifying and implementing monitoring measures, including post-project audits.

The Proponent must provide the highlights within the EIS of the public engagement process undertaken by the Proponent to ensure that all parties involved have a clear understanding of the

Project and its potential effects. The EIS should include the methods used, the results, and the ways in which the proponent intends to address the concerns identified.

2.3 Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge

As required under Article 12, Section 12.5.2 of the *Nunavut Agreement* and s. 101(3) of the *NuPPAA*, the Proponent must include a discussion of all Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge acquired and considered in the preparation of the EIS. The term Inuit Qaujimaningit is meant to encompass Inuit traditional knowledge (and variations thereof or Inuit Qaujimajatuqangit), local and community-based knowledge, as well as Inuit epistemology as it relates to Inuit Societal Values and Inuit Knowledge (both traditional and contemporary). Inuit Qaujimaningit is rooted in the daily life of Inuit people and represents experience acquired over thousands of years of direct human contact with the environment. Inuit Qaujimajatuqangit refers to traditional values, beliefs, principles and experience regarding the environment ([Ellis, 2005](#); [Hansen and VanFleet, 2003](#); [QIA, 2009](#); [Thorpe et al., 2001](#); [Usher, 2000](#); [Wenzel, 1999](#); [White, 2006](#)).

With its emphasis on personal observation, collective experience and oral transmission over many generations, Inuit Qaujimaningit provides factual information on such matters as ecosystem function, social and economic well-being, and explanations of these facts and causal relations among them. In this regard, Inuit Qaujimaningit plays a significant role in NIRB assessments by contributing to the development of accurate baseline information; comparing predictions of effects with past experience; and assisting in the assessment of the magnitude of projected effects ([Usher, 2000](#)).

The Proponent is required to incorporate Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge into its EIS. The NIRB understands that the availability of such information may be limited by obligations of confidentiality and other ethical obligations that may be attached to such information, but expects the Proponent to take reasonable measures to access this type of information for incorporation into the EIS.

2.4 Precautionary Principle

The NIRB's Review process is designed to assess projects in a careful and precautionary manner and to ensure that projects do not cause significant adverse environmental effects. Principle 15 of the 1992 Rio Declaration on Environment and Development states that "[w]here there are threats of serious or irreversible damage; lack of full scientific certainty must not be used as a reason for postponing cost-effective measures to prevent environmental degradation" ([UNCED, 1992](#)). When the precautionary principle applies, it is the Proponent who bears the burden of proof to show that despite this uncertainty, the potential for adverse environmental impacts can be mitigated or reversed. To demonstrate the application of the precautionary principle to the Project, the Proponent must include information to:

- Demonstrate that the Project is examined in a manner consistent with the precautionary principle in order to ensure that they do not cause serious or irreversible damage to the environment;

- Outline the assumptions made about the effects of the Project and the approaches to minimize these effects, including assumptions that are developed where scientific uncertainty exists;
- Identify any follow-up and monitoring activities planned, particularly in areas where scientific uncertainty exists in the prediction of effects; and
- Present public views on the acceptability of these effects.

The Canadian Privy Council Office’s *A Framework for the Application of Precaution in Science-based Decision Making About Risk* ([PCO, 2003](#)) sets out guiding principles for the application of the precautionary principle to science-based decision-making that should be considered by the Proponent in the development of the EIS and the Project.

2.5 Sustainable Development

Sustainable development is defined as development that “*meets the needs of the present without compromising the ability of future generations to meet their own needs*” ([UN, 1987](#)). The central task of environmental impact assessment is to contribute to sustainable development by safeguarding the sustainability of valued components (VCs) in the face of development that might compromise that sustainability ([Duinker and Greig, 2006](#)). Promotion of the principle of sustainable development is fundamental to the NIRB’s primary objectives laid out in Section 12.2.5 of the *Nunavut Agreement* and s. 23 of the *NuPPAA*.

These guidelines are based upon three (3) factors that the NIRB considers directly associated with sustainable development. These factors are:

- 1) The extent to which biological diversity is affected by the Project;
- 2) The capacity of renewable and non-renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of future generations; and
- 3) The “precautionary principle” (as outlined above).

The NIRB interprets progress towards sustainable development as meeting the following goals where possible:

- 1) Preservation of ecosystem integrity, including the capability of natural systems (local and regional) to maintain their structure and functions and to support biological diversity;
- 2) Respect for intergenerational equity. That is, the right of future generations to the sustainable use of renewable and non-renewable resources depends on our commitment to those resources today; and
- 3) The attainment of durable social and economic benefits, particularly in Nunavut.

The Proponent’s EIS should clearly demonstrate how the Project meets these three (3) goals.

3.0 SCOPE OF THE NIRB ASSESSMENT

As set out in ss. 99(1)(a) and 99(1)(b) of the *NuPPAA*, the first step in the Review requires that the NIRB determine the scope of the project proposal, as well as the scope of the assessment. The scope of the NIRB's assessment for a project proposal is based on the requirements of Section 12.5.2 of the *Nunavut Agreement* and s. 101(3) of the *NuPPAA*, the project proposal submitted by the Proponent, and any direction provided by the Minister to the NIRB under s. 96(1) of the *NuPPAA*.

The scope of the Project is defined in relation to the project proposal received by the NIRB from the Proponent, and must include any work or activity identified in the project proposal, as well as any other work or activity that the Board considers sufficiently related to the project. The Board may also exclude any work or activity from the scope that it considers insufficiently related to the project. If the NIRB determines that an inclusion or exclusion to scope of the Project should be made, the Board would consult with the Proponent and would amend the scope after considering any comments the Proponent may provide. If the Board adds to the scope of the Project the Board would not proceed with the Review until the Nunavut Planning Commission and the responsible Minister(s) have had an opportunity to again exercise their powers and perform their duties or functions in relation to the Project as re-scoped.

The scope of the assessment determines the expectations of the process based on significant issues related to the Project, defining the components of the biophysical and/or socio-economic environment that could be impacted by the Project and for which there is public concern. This scope confirms which valued ecosystemic and socio-economic components must be considered to determine the potential for impacts associated with the project proposal through all planned project stages of the development, and which the Proponent will be required to examine within its EIS.

The *Draft* Scope List for the NIRB's assessment of the Grays Bay Road and Port proposal has been included as [Appendix A](#) to these Guidelines.

4.0 PREPARATION AND REVIEW OF THE ENVIRONMENTAL IMPACT STATEMENT

4.1 Guidance

In preparing the EIS, the Proponent must follow the EIS Guidelines closely, while paying attention to the requirements of the *Nunavut Agreement* and the *NuPPAA*, the General EIS Principles as described in the NIRB's *Guide 7: Guide to the Preparation of Environmental Impact Statements* ([NIRB, 2006b](#)) and the additional specific project guidance provided by the NIRB based on the information contained within the Project Description.

Furthermore, the Proponent should note that directions regarding the EIS format are a submission requirement of the NIRB. A detailed discussion of the EIS format requirements may be found in [Section 5.0](#) of this document.

The EIS Guidelines are intended to facilitate the Proponent's development of an EIS, the NIRB has endeavoured to make this document as comprehensive as possible to identify the majority of

information requirements for the entire NIRB review process and increase certainty of expectations by all parties. It is however, recognized that some of the information requested may not be available for the initial EIS submission to the NIRB. When the Proponent identifies that specific information will not be available for the submission of its initial EIS, the Proponent shall include a scheduled timeline for the provision of the requested information within the EIS or to the NIRB separately. If the initial EIS submission is incomplete, the NIRB will consider the initial EIS submission to be a *draft* EIS document, recognizing that the level of information requested or available will evolve and develop as the Review progresses from the *draft* EIS submission to a *Final* EIS submission.

The Proponent is also encouraged to consult with the NIRB and, if applicable, other regulatory authorities, during the planning and development of the EIS and supporting documents.

4.2 Study Strategy and Methodology

It is the NIRB's expectation that the Proponent will focus its discussions on key issues, and will provide a level of detail appropriately weighted to the importance of the issue being analyzed. Except where specified by the NIRB, the Proponent has the discretion to select the most appropriate methods to compile and present data, information and analysis in the EIS as long as the methods are transparent, justifiable and replicable.

It is the sole responsibility of the Proponent to prepare an EIS that includes sufficient baseline data and analysis for a complete assessment of the anticipated impacts of the Project. The EIS should be concise and should focus on the assessment of significant ecosystemic and socio-economic impacts. The Proponent must explain and justify methods used to predict impacts of the project on each valued ecosystem component (VECs) and each valued socio-economic components (VSECs) (collectively the Valued Components (VCs)). The information presented must be substantiated; in particular, the Proponent must describe how the VCs were identified and what methods were used to predict and assess the project's potential adverse environmental effects on these components. The value of a component not only relates to its role in the ecosystem, but also to the value that humans place on it. The culture and way of life of the people using the area affected by the project may be considered VCs themselves. The EIS will also explain and justify methods used to identify mitigation measures and follow-up program elements.

The EIS will document how scientific, engineering, Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and traditional and community knowledge were used to reach conclusions and that assumptions must be clearly identified and justified. All data, models, and studies should be documented such that the analyses are transparent and reproducible. All data collection methods must be specified. The uncertainty, reliability, and sensitivity of models used to reach conclusions must be indicated. The sections in the EIS regarding the existing environment and the potential adverse environmental effects predictions and assessment must be prepared, using best available information and methods, to the highest standards in the relevant subject area and finally, all conclusions must be substantiated.

The EIS will identify all significant gaps in knowledge and understanding related to key conclusions, and the steps to be taken by the Proponent to address these gaps. Where the

conclusions drawn from scientific, engineering, and technical knowledge are inconsistent with the conclusions drawn from Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge, the EIS will contain a balanced presentation of the issues and a statement of the Proponent's conclusions.

Omissions in the EIS Guidelines issued by the NIRB cannot be used to justify any inadequacies in the EIS. The EIS must be a stand-alone document that allows the reader to understand the Project and its likelihood to cause significant ecosystemic or socio-economic effects.

4.3 Use of Existing Information

In preparing the EIS, the NIRB expects the Proponent will utilize available and pertinent results of surveys and studies completed in the Project region by other developers, government agencies, organizations, institutions, regional authorities, and individual researchers. For example, lessons learned at previous and/or currently active projects in Nunavut (e.g., the Meadowbank Gold Mine project, the Jericho Diamond Mine project, Doris North Gold Mine Project, etc.) and the Proponent should incorporate these lessons. When using existing information to meet the requirements of various sections of the EIS Guidelines, the Proponent should include the information directly in the EIS with clear reference indicating the source of information (i.e., document, section, and page numbers).

The Proponent must explain the relevance and application of existing information in the EIS, including highlighting data gaps and potential limitations and discuss how limitations in existing information might affect the ability to draw reliable conclusions in the assessment.

PART II – THE ENVIRONMENTAL IMPACT STATEMENT

Part II of this document provides specific instructions for the content of each section in the EIS. The EIS as a whole must reflect the guiding principles in Part I of the EIS Guidelines.

5.0 GUIDANCE ON THE CONTENT AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT

5.1 Content

The EIS shall contain, at a minimum, the following information as outlined in Article 12, Section 12.5.2 of the *Nunavut Agreement* and s. 101(3) of the *NuPPAA*:

- (a) a description of the project, the purpose of, and need for, the project;
- (b) the anticipated effects of the environment on the project, including effects associated with natural phenomena, such as meteorological and seismological activity, and climate change;
- (c) the anticipated ecosystemic and socioeconomic impacts of the project, including those arising from the effects referred to in paragraph (b);
- (d) the measures proposed by the proponent to
 - (i) avoid and mitigate adverse ecosystemic and socio-economic impacts, including contingency plans,
 - (ii) optimize the benefits of the project, with specific consideration given to expressed community and regional preferences in regard to benefits,
 - (iii) compensate persons whose interests are adversely affected by the project, and
 - (iv) restore ecosystemic integrity after the permanent closure of the project;
- (e) any monitoring program of the project's ecosystemic and socio-economic impacts that the proponent proposes to establish;
- (f) the interests in land and waters that the proponent has acquired or seeks to acquire;
- (g) options for carrying out the project that are technically and economically feasible and the anticipated ecosystemic and socio-economic impacts of those options; and
- (h) any other type of information relating to a matter within the Board's jurisdiction that the Board considers relevant in the circumstances.

5.2 Concordance Table

The EIS shall contain a table of concordance that cross-references the information presented in the EIS (document, section, and page number) with the information requirements identified in the EIS Guidelines. The basis of the concordance table shall be the factors as listed in [Section 8.1.1](#). The Proponent is advised to consult with the NIRB if the EIS will deviate in a substantive way from the direction given in the guidelines.

5.3 Presentation

The EIS should be written in clear, precise language and include the following:

- A summary of the EIS (referred to as the EIS main document);
- A glossary of technical words, acronyms, and abbreviations;
- As appropriate, charts, diagrams, tables, maps, and photographs to clarify the text;
- Drawings that clearly convey the various components of the Project;
- Maps presented in a consistent and clearly identified datum and at appropriate and clearly identified scales to allow for comparison and overlay of mapped features;
- An index to the EIS that references locations in the text by volume, section, sub-section, and page of all key subjects;
- Separate Appendices (cross-referenced in the main EIS document) that provide detailed studies (including all relevant and supporting data and methodologies);
- A list of all tables, figures, and photographs; and
- A complete list of supporting literature and references.

For clarity and ease of reference, the EIS should be presented in the same order as the EIS Guidelines, or where current best-practices provide an appropriate alternative. For purposes of brevity and to avoid repetition, cross-referencing within the EIS is preferred.

The Proponent will provide copies of the EIS and its summaries for distribution in hard copy and in an unlocked, indexed, and fully searchable PDF format, as directed by the NIRB. The Proponent shall be responsible, where requested, for the delivery of the EIS to regulators and relevant authorities. As the NIRB is required to make the EIS available to the public for review, for purposes of uploading and distribution, individual file sizes should be no larger than 10 MB (using only low resolution images). If the Proponent determines that certain files are better presented with higher resolution, then these files can be submitted to the NIRB; however, such files may only be distributed by the NIRB to the public upon request.

5.4 Translation

For efficiency, the Proponent shall prepare the main document and the summary of each thematic volume of the EIS in both of Canada's official languages (French and English) and in Inuktitut and Inuinnaqtun. Maps shall indicate common and accepted place-names usually referred to by the local populations in their own language, in addition to their official toponyms, especially where traditional Inuit place-names have been made official through the process outlined in Section 33.9 of the *Nunavut Agreement*.

5.5 Main Document of the Environmental Impact Statement

The Proponent will prepare a summary of the EIS in all languages as described in [Section 5.4](#) and provide it to the NIRB at the same time as the EIS. The main document will include the following:

- A concise description of all key components of the project and related activities;
- A summary of the consultation conducted with affected communities, residents, Inuit Organizations, Indigenous groups, and other governments or other organizations, including where relevant, adjacent jurisdictions outside of the Nunavut Settlement Area. The summary should include the issues raised and the proponent's responses;
- An overview of expected changes to the environment
- An overview of the key environmental effects of the project and proposed technically and economically feasible mitigation measures; and
- The proponent's conclusions on the residual environmental effects of the project after taking mitigation measures into account and the significance of those effects.

The main document should be structured as follows:

1. Executive and Popular Summaries
2. Introduction and environmental assessment context
3. Project overview
4. Scope of project and assessment
5. Alternative means of carrying out the project
6. Public consultation
7. Summary of environmental effects assessment for each VC, including:
 - Description of the baseline;
 - Anticipated changes to the environment;
 - Anticipated effects;
 - Mitigation measures;
 - Significance of residual effects
8. Follow-up and monitoring programs proposed

The main document will have sufficient details for the reader to learn and understand the project, potential environmental effects, mitigation measures, and the significance of the residual effects. The main document will also include key maps illustrating the project location and key project components.

5.6 Summaries

The EIS shall include both an executive summary and popular summary as described below:

5.6.1 Executive Summary

The Executive summary should include the following:

- A summary of all key components of the Project and related activities;

- A summary of the key environmental effects of the project and proposed technically and economically feasible mitigation measures with particular reference to the overall conclusions of the assessment, and a clear rationale relating those conclusions to the predicted impacts and the measures proposed to address them;
- Summary on items of known or expected public concern and the significant potential impacts of the Project and the methods proposed to address them. It shall also address outstanding issues and the strategies proposed to address them; and
- The Proponent's conclusions on the residual environmental effects of the project after taking mitigation measures into account and the significance of those effects.

The summary shall form part of the EIS, but it shall also be made available as a separate document and should be presented in English, French, Inuktitut, and Inuinnaqtun. The summary will have sufficient details for the reader to learn and understand the Project, potential environmental effects, mitigation measures, the significance of the residual effects and follow-up program.

5.6.2 Popular Summary

The Popular Summary shall have the same general structure and objectives as the Executive Summary, but it shall be written in non-technical language and shall include a glossary and additional explanatory text to assist non-specialists in appreciating the content of the EIS as a whole. Maps indicating major project components including shipping and ground transportation route(s), and the potentially affected communities should be included, and should be presented in English, French, Inuktitut, and Inuinnaqtun. The Popular Summary shall form part of the EIS, but it shall also be made available as a separate document.

6.0 INTRODUCTORY SECTIONS OF THE ENVIRONMENTAL IMPACT STATEMENT

6.1 Project Overview

The EIS will describe key project components and associated activities, scheduling details, the timing of each phase of the project and other key features. If the Project is a part of a phased sequence of projects, the EIS will outline the larger context.

The overview is to help identify the Project's key components, rather than provide a detailed description of the Project, which will follow in [Section 7.0](#) of this document.

6.2 Project Location

The EIS will contain a concise description of the geographical setting in which the project will take place. This description will focus on those aspects of the project and its setting that are important in order to understand the potential environmental effects of the project. The description will address the natural and human elements of the environment as well as explain the interrelationships between the biophysical environment and people and communities. The following information will be included:

- Geographical maps of the project location (at an appropriate scale) including project components, project boundaries of the proposed site with the Universal Transverse Mercator (UTM) coordinates – the lease boundary, site study area, local study area, regional study area, the major existing infrastructure, adjacent land uses and any important environmental features. The maps should include:
 - The proposed Grays Bay Port;
 - The Jericho Station;
 - The proposed all weather access road route, including connection to any winter road or other planned all-weather road;
 - The proposed winter road;
 - The proposed quarry sites along the road, rescue shelters along the winter road and camps along the all-weather road; and
 - Any other significant individual project areas such as long or multi-span bridges;
- Current land use in the area and the relationship of the project facilities and components with any Crown land, Inuit Owned Land, and Commissioner’s land;
- The environmental significance and value of the geographical setting in which the project will take place and the surrounding area;
- Environmentally sensitive areas, such as national and territorial parks, ecological reserves, habitats of federally listed species at risk (Schedule 1 of Species at Risk Act) and other sensitive areas;
- Local communities; and,
- Land Tenure (see [Section 6.2.1](#)).

The EIS will provide expanded description and mapping of the project location, including each of the project components as outlined in [Section 7.0](#) of this document. Maps of the project’s location at an appropriate scale will accompany the text. The location map should include the boundaries of the proposed site including UTM coordinates, the major existing infrastructure, adjacent land uses and any important environmental features. In addition, site plans/sketches and photographs showing project location, site features, and the intended location of project components will be included.

6.2.1 Land Tenure

The Proponent shall delineate on a map of suitable scale the legal boundaries of any areas to which it will acquire rights through lease or other tenure arrangements, including Crown land, Inuit Owned Land, and Commissioner’s land. It shall further describe those areas by providing such information as, but not limited to, site coordinates, land size, file numbers, start and end dates, fees, name of right holder, and any post-authorization amendments and/or renewals.

The Proponent shall also provide information on existing tenures, licences, permits or other authorizations that would be potentially impacted by the Project and provide a record on consultations with holders of such tenures, permits, or authorizations.

6.3 Proponent Information

The Proponent shall identify itself and explain current and proposed ownership of rights and interests in the Project, operational arrangements, and corporate and management structures. It shall specify the mechanisms used to ensure that corporate policies are respected. The Proponent shall present its environmental policy and shall specify whether and how it applies to all businesses for which it has an operating responsibility, to employees, to contractors, to subcontractors and to suppliers. This policy shall also describe its reporting systems. Furthermore, the Proponent shall provide complete contact information, including telephone and fax numbers, postal and email addresses, and shall include, where necessary, separate addresses for corporate and operations (or other relevant) offices.

The Proponent shall describe its past and/or present experience in the activities being proposed for the Project (e.g., transportation networks involving air shipping, marine shipping, and winter and all-weather road components). The Proponent should reference:

- Its record of compliance with governmental policies and regulations pertaining to environmental and socio-economic issues in past operations;
- Its record of safety, major accidents, spills and emergencies, and corresponding responses;
- Its record in honouring commitments on environmental and socio-economic matters in the event of planned or premature Project closure, whether temporary or permanent, or due to change of ownership;
- Its relations with Indigenous peoples, including prior experience with any Impact and Benefits Agreements if appropriate;
- Its history of operations in Arctic and Sub-arctic regions;
- Its record in incorporating environmental and socio-economic considerations into construction, operations, maintenance, temporary closure (care and maintenance), final closure (decommission and reclamation), and post-closure; and
- Corrective actions it has undertaken in the past, distinguishing between those taken voluntarily and those taken at the insistence of a third party.

The Proponent shall identify and describe any obligations or requirements that it must meet to post a bond or other forms of financial security to ensure payment of compensation in the event of accidents that directly or indirectly result in major damage by the Project to the environment, as well as to cover the cost of planned or premature closure, whether temporary or permanent. The Proponent shall provide information on the current status of Project financing, and financial preparedness to meet the requirements for reclamation and security should the Project proceed.

If the Proponent does not have prior experience in transportation networks, particularly for Nunavut or Northern Canada, discussion should include how the experience will be obtained (e.g., other northern projects) and it shall explain the safeguards that it intends to put in place to compensate for the lack of prior experience.

6.4 Regulatory Regime

The Proponent shall present its understanding of the regulatory regime in which it would be operating by identifying the requirements of all relevant federal, territorial, and local environmental and socio-economic standards, laws, regulations, policies, guidelines, and fiscal regimes relating to Project approval, construction, operations, maintenance and monitoring, temporary closure (care & maintenance), final closure (decommission & reclamation), and post-closure activities. This section should also explain how the requirements would be met and what specific governmental permits and approvals would be required. A list of currently held and required permits and licences, including dates of issue and expiry (as applicable), shall be appended. Requirements imposed by Article 12 of the *Nunavut Agreement* may be excluded from this discussion.

The Proponent should also include a discussion of any steps it proposes to take to ensure it meets its Project related tax obligations (including fuel and payroll taxes) with the Government of Nunavut (GN). The Proponent should, if applicable, also provide any relevant non-confidential information regarding its relationship with the GN in terms of the optional fuel-rebate program.

6.5 Regional Context

The Proponent shall describe in general terms the regional biophysical and socio-economic environments of the region and Nunavut as a whole, including:

- Ecological land classifications;
- Ecological processes and relationships;
- The location of other base and precious metal finds and other existing and potential developments; and
- Current and future land use plans.

7.0 PROJECT COMPONENTS AND ACTIVITIES

The following sections contain explicit requirements for the EIS with regard to Project components and all activities associated with each project component through the life of the Project.

7.1 Project Design

General Project design information discussed in the EIS shall include:

- An explanation of how the biophysical environment has influenced the design of the Project. This should include consideration of relevant geographical, geological, meteorological, hydrological, and oceanographic conditions. This discussion should also include current land use activities;

- A discussion on how the potential for climate change effects on the Project has influenced the design, planning, and management of the Project components and activities;
- A discussion of how design, engineering, and management plans will maintain/enhance the existing ecosystemic integrity, focusing on wildlife habitats, including freshwater habitat, marine habitat, and terrestrial habitat;
- A discussion of how the Proponent has applied the precautionary principle in its Project planning, design, and management;
- A discussion of how potential impacts to workers and the public under both normal operations and potential accident and malfunction situations have influenced the design of the Project;
- A discussion of how potential impacts to wildlife (e.g., caribou, Polar Bears, Peregrine Falcons, etc.) have influenced the design of the Project especially indicating methods to minimize impacts to wildlife, including the geographical location of project components;
- A discussion of how regional socio-economic conditions have influenced the Project design. For example, how local preferences and labour capacity, have influenced the design of work rotations, pace of construction, and employment policy.
- A discussion of how project design, particularly project infrastructure and site preparation, has been influenced by the distribution of archaeological resources and sites used for harvesting of wildlife and quarrying of soapstone;
- A discussion of how public consultation and Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge have influenced the planning and design of the Project; and
- The considerations for future development.

All assumptions underlying design features which are relevant to environmental assessment should be explicitly stated.

7.2 Analysis of Need and Purpose

The EIS will describe the need for, and purpose of the Project by providing the rationale for the Project, explaining the background, the problems, or opportunities that the Project is intended to satisfy and the stated objectives from the perspective of the Proponent. The following points must also be addressed in the discussion:

- General feasibility from an economic perspective, including how the Project will benefit communities in Nunavut, either directly or indirectly;
- An assessment of the longer term strategic implications of the Project, and how it may affect or contribute to transportation and other infrastructure networks (existing and proposed) in Nunavut;

- Identification of past, current and potential future users of the local study area (LSA), regional study area (RSA), and project infrastructure, including commercial, government, public, and private; and
- An analysis of the overall net benefit of the Project in terms of Nunavut, and of Canada as a whole, which includes considerations in addition to the economic contributions of the Project.

Discussions addressing the above points shall be supported by an analysis of the positive and negative social and economic effects on existing industries, markets, and communities over the life of the Project. This analysis should also indicate the distribution and magnitude of benefits and/or losses to specific socio-economic groups in the relevant study area.

7.3 Scope of the Project

As outlined in [Section 3.0](#), the scope of the Project shall be defined to reflect the project proposal received by the NIRB from the Proponent, and must include any work or activity identified in the project proposal, as well as any other work or activity that the Board considers sufficiently related to the Project. The NIRB may also exclude any work or activity from the scope that it considers insufficiently related to the Project.

The Proponent will consider all phases, components, activities, and works identified in the scope of the Project as part of the effects assessment.

7.3.1 Detailed Project Proposal Description

The Proponent shall describe the Project components and all activities associated with each in a systematic way. The description shall encompass all phases of development in sufficient detail to allow the Proponent to predict potential adverse environmental effects and address public concerns about the Project including:

- Site preparation
- Construction;
- Operations, including any potential modifications and/or expansions that may be required during the operations phase;
- Maintenance;
- Temporary closure (care and maintenance);
- Final closure (decommission and reclamation); and
- Post closure activities.

The description must include an approximate timeline for each Project component and all activities associated with each component, if applicable. The description should also include changes that would occur in the vicinity as a consequence of the Project activities. Where specific codes of practice, guidelines, and policies apply, especially if involving thresholds and quantitative limits to be applied, these documents must be cited and may even be included as appendices to the EIS.

For greater clarity, the detailed description of Project components and activities, where appropriate, should cross-reference the impact assessment, environmental management, and overall development plan sections of the EIS.

In addition to above, the Proponent is required to provide a detailed written and graphic description (e.g., map, diagrams, dioramas, and drawings) of the following physical features of the Project at the proposed sites:

- a) The Grays Bay Port;
- b) The winter road;
- c) The all-weather access road;
- d) The Jericho Site;
- e) All related works and activities including all temporary facilities required for the construction of the previously mentioned facilities, in particular:
 - i. Temporary control structures and diversion works;
 - ii. Permanent and temporary work camps;
 - iii. Permanent and temporary access roads and water access/transportation routes;
 - iv. Bridges and watercourse crossings;
 - v. Infrastructure for wastewater treatment and waste management;
 - vi. Energy supply for camps and worksites;
 - vii. Drinking water supply;
 - viii. Borrow pits and quarries;
 - ix. Management of excavated material; and
 - x. Construction worksites and storage areas.

7.3.2 Project Phases

The Proponent is required to present an overall development plan that describes the Project development phases [site preparation, construction, operation, maintenance, any potential modifications, temporary closure (care and maintenance), final closure (decommission and reclamation) and post-closure], relevant timeframes, works and undertakings associated with each of these phases. The plan must include consideration for temporary closure, or care and maintenance recognizing that operations may come to an unforeseen pause. The Proponent should also clarify all associated monitoring and/or mitigation plans to be implemented in each of the identified phases to eliminate or minimize adverse effects that might occur at various project stages for each Project element.

7.3.2.1 Construction

The Proponent shall provide up-to-date construction and commissioning schedules for each Project component for the Grays Bay Road and Port Project. The Proponent shall present the approach, description, materials, methodology, locations, and security measures of all planned construction activities and components.

a) *Port Facility:*

- i. Describe all water access/transportation routes and confirm that adequate bathymetric information is available for the route that will be utilized by barges and vessels;
- ii. Provide details on the design of all permanent and temporary infrastructures including construction methodology of the port facility;
- iii. Describe activities related to port facility preparation and include a schedule of each task;
- iv. Describe methodology to control and manage sedimentation to protect shoreline stability;
- v. Describe methodology and timing of dredging activities;
- vi. Describe methodology for usage or disposal of dredged material;
- vii. Describe methodology on fish habitat maintenance and fish passage; and
- viii. Describe the design of the port facility and small craft harbour, including information on the volume, timing and frequency of traffic expected during the construction, operation and decommissioning phases.

b) *Access/Transportation Infrastructure:*

- i. Describe all land, air, and water access/transportation routes;
- ii. Provide details on the design of all permanent and temporary infrastructures;
- iii. Describe activities related to all access road/trail preparation and include a schedule of each task;
- iv. Describe methodology to control and manage sedimentation to protect the shoreline stability of the streams, rivers, and lakes in each watershed of the RSA;
- v. Describe methodology on fish habitat maintenance and fish passage;
- vi. Describe access roads/trails, providing information on locations, routing, anticipated traffic, technical characteristics and general road construction standards (e.g., maintenance, useful life, ditches, bridges, culverts, the use of de-icers, and dust control methods); and
- vii. Describe design of airstrips, including information on the volume, timing and frequency of traffic expected during the construction, operation and decommissioning phases.

c) *Borrow Pits and Quarries:*

- i. Identify sources, quantity and end use of all rock and aggregate material;
- ii. Provide an assessment of the potential for and the impacts of, metal leaching and acid rock drainage (ML/ARD); and
- iii. Outline methods for the prediction and prevention of ML/ARD to be used or that which is currently used in the quarry site selection process.

d) *Personnel requirements:*

- i. Provide an estimate of the size of the construction workforce by month throughout the construction phase. Indicate occupations as per National

- Occupation Classification codes, skills, entry requirements and duration of work; and
- ii. Provide a forecast of the working schedule for the construction phase of the Project.
- e) *Temporary Structures and Supporting Infrastructure:*
- i. Describe camp locations, drinking water source(s), methods to manage wastewater and solid waste, locations of wastewater and solid waste (e.g., domestic and construction waste) management facilities, waste discharge points, information on power supply, location and size of fuel storage depot(s) and management of all installations required for the proper operation of camps;
 - ii. Describe in detail and provide locations of any communications and/or telecommunications systems required by the Project (e.g., access roads, energy sources);
 - iii. Describe the type, locations and management of all diversion and control sections/structures;
 - iv. Describe the locations, methods, capacity and management of material and fuel receiving, handling, and storage areas;
 - v. Provide details on the locations, capacity and management of waste disposal and recycling sites for domestic and construction waste;
 - vi. Identify and quantify the use and production of dangerous products and waste generated by the Project;
 - vii. Provide an inventory of equipment and material required, including hazardous material;
 - viii. Provide details on the construction methodology, schedule and locations of barge landings/docks; and
 - ix. Provide details on the construction methodology, schedule and locations of all airstrips (if airstrips are proposed as part of the Project).
- f) *Mitigation and Compensation Works:*
- i. Describe any physical works proposed to serve as mitigation or compensation features (e.g., sedimentation control).
- g) *Demobilization:*
- ii. Describe the approach and provide conceptual plans for the demobilization of all infrastructure;
 - iii. Identify the operation, use, development, possible rebuilding and eventual dismantling and demobilization of installations with consideration to the environment and other land uses; and
 - iv. Provide detailed methodology for the abandonment and restoration of the Project area when the Project reaches the end of its life.

7.3.2.2 Operation and Maintenance

The Proponent shall provide detailed descriptions of all aspects of the operation and maintenance of the Project and shall include, but not be limited to the following:

- a) *Operational Parameters:*
 - i. Describe the control and management of sedimentation and erosion;
 - ii. Describe maintenance and management plans for all structures and facilities; and
 - iii. Describe management of ice, including frazil ice.
- b) *Transportation Routes and Infrastructure:*
 - i. Describe all land, air, and water access/transportation routes, including frequency of use and operational season;
 - ii. Describe ice breaking/management methods to be used, if any, during the marine shipping season; and
 - iii. Describe roads and facilities maintenance (e.g., wildlife management, dust control, de-icing).
- c) *Personnel Requirements:*
 - i. Provide an estimate of the size of the operation and maintenance workforce by month throughout the life of the Project. Indicate occupations as per National Occupation Classification Codes, skills, entry requirements, and duration of work; and
 - ii. Provide a forecast of the working schedule for the operation and maintenance of the Project.
- d) *Fuel and Hazardous Material:*
 - i. Identify and quantify the use, production on-site (if relevant) and management of fuel and hazardous material utilized in the operation and maintenance phase of the Project; and
 - ii. Provide details on material receiving, handling, and storage as well as the management of fuel and hazardous material.
- e) *Waste:*
 - i. Identify and quantify the production and management of waste (e.g. liquid and solid waste, discarded equipment) generated in the operation and maintenance phase of the Project.
- f) *Operational Requirements:*
 - i. Describe all requirements to operate the Project, in addition to permits and authorizations (e.g., agreements with the Regional Inuit Association, securities, insurance).

7.3.2.3 Closure

The Proponent shall provide a proposed sequence and methodology for the disassembly of all Project infrastructure; and propose restoration/reclamation strategies to bring the Project sites into a state as close to the original environment as possible.

7.4 Future Development

The Proponent shall evaluate any foreseeable expansions of the current Project, the needs of required infrastructure, and associated ecosystemic and socio-economic impacts. The Proponent

shall also evaluate the potential for development of mining projects or other activities in the Project area, which could use the Project infrastructure in accordance with previous and current exploration activities, and other potential transportation corridors which may connect with Project infrastructure.

In addition, the Proponent shall discuss how any foreseeable future development scenarios have been taken into consideration when designing the infrastructure and ancillary utilities for the Project. The Proponent's assessment of cumulative impacts of the Project shall also include the future development scenarios as outlined above.

7.5 Alternatives

The EIS shall include an explicit analysis of all alternative means of carrying out the Project components or activities, including a "no-go" alternative, the identification and application of criteria used to determine the technical feasibility and economic viability of the alternatives to the Project (e.g., transportation, natural, social, economic and cultural environment). This analysis must be done to a level of detail which is sufficient to allow the NIRB and the public to compare the Project with the alternatives in terms of the economic costs and the environmental, social and economic impacts and benefits. The Proponent must include reasons for selection of the Project as the preferred alternative, and the reasons for rejection of other alternatives. Through the course of its alternative assessment, if the preferred alternative changes, the Proponent should consult with the NIRB to determine whether this proposed change would result in a change to the scope of the Project under Review.

The assessment of alternatives should demonstrate:

- The assessment of economic viability for each alternative has considered vulnerability of the arctic ecosystem, as well as the potential for extension of the life of the Project
- The criteria used to evaluate alternative means reflects the potential concern for both the short-term (during construction and operations) and long-term (after decommissioning and reclamation) physical-chemical stability and environmental impacts of the Project;
- The requirements of [Section 8.6.3](#) of this document, particularly the potential for cumulative impacts on the marine ecosystem and on traditional harvesting activities have been considered;
- Baseline data, valued components, and assessment boundaries have been considered;
- Alternate routing options, alternative sites for the location of the Project (including port locations) have been considered; and
- As indicated in the public consultation section ([Section 8.2](#)), public opinions and preferences have been taken into consideration as a criterion in the assessment of all the alternative options, including a discussion of how public consultations by the Proponent have influenced the Project planning, and how public preferences have been considered by the Proponent in determining the preferred project alternatives.

7.6 Economic and Employment Information

In order to understand the context of the Project, the EIS shall include a description of the economic and employment aspects of the Project, including:

- Capital costs, estimated operating costs, including closure costs and the total expected revenues (current market values);
- The number of person years of work, broken down by life cycle stage;
- The number and types of jobs and required skills (using a recognized classification system) including training requirements for each position;
- Contracting and procurement information including, if known, a breakdown of the number and types of jobs that will be done by contractors and what the contractor obligations to employees will be;
- Estimation of the number of jobs to be created directly and indirectly by the Project, with consideration of local business and supplying contracting;
- Worker housing situations including number of workers expected to be residing onsite or in workers' camp(s), on-site services and facilities for workers, transportation to work and proposed work schedule;
- Discussion of the commuting arrangements for local hired workers, especially those who live in the communities without proposed direct air transport to the Project site(s) and how the Proponent plans to support the fly-in/fly-out workforce with in-community liaison workers;
- Expectations and perceptions to employment at the Project by the residents in the Project RSA; and
- Information on benefits that might be expected by employees and whether these benefits will extend to contractor employees (e.g., training, skill enhancement, cultural support, wellness program).

8.0 IMPACT ASSESSMENT METHODOLOGY

8.1 Scope of the Environmental Assessment

8.1.1 Factors to be considered

Scoping establishes the environmental assessment parameters and focuses the assessment on relevant issues and concerns. The environmental assessment of the designated project in support of the Board's Review of the Project must address the following factors, as listed in s. 103(1) of the *NuPPAA*:

- (a) the purpose of the project and the need for the project;
- (b) whether, and to what extent, the project would protect and enhance the existing and future well-being of the residents and communities of the designated area, taking into account the interests of other Canadians;

- (c) whether the project reflects the priorities and values of the residents of the designated area;
- (d) the anticipated effects of the environment on the project, including effects associated with natural phenomena, such as meteorological and seismological activity, and climate change;
- (e) the anticipated ecosystemic and socioeconomic impacts of the project, including those arising from the effects referred to in paragraph (d);
- (f) the cumulative ecosystemic and socioeconomic impacts that could result from the impacts of the project combined with those of any other project that has been carried out, is being carried out or is likely to be carried out;
- (g) whether the impacts referred to in paragraphs (e) and (f) would unduly prejudice the ecosystemic integrity of the designated area;
- (h) the measures, including those proposed by the proponent, that should be taken to
 - (i) avoid and mitigate adverse ecosystemic and socio-economic impacts, including contingency plans,
 - (ii) optimize the benefits of the project, with specific consideration given to expressed community and regional preferences in regard to benefits,
 - (iii) compensate persons whose interests are adversely affected by the project, and
 - (iv) restore ecosystemic integrity after the permanent closure of the project;
- (i) the significance of the impacts referred to in paragraphs (e) and (f), taking into account the measures referred to in paragraph (h);
- (j) the capacity of renewable resources that are likely to be significantly affected by the project to meet the existing and future needs of the residents of the designated area;
- (k) any monitoring program of the project's ecosystemic and socio-economic impacts that should be established, including one proposed by the proponent;
- (l) the interests in land and waters that the proponent has acquired or seeks to acquire;
- (m) the options for carrying out the project that are technically and economically feasible and the anticipated ecosystemic and socioeconomic impacts of such options;
- (n) the posting of performance bonds;
- (o) the particular issues or concerns identified under subsection 96(1); and
- (p) any other matter within the Board's jurisdiction that, in its opinion, should be considered.

8.1.2 Scope of Factors

8.1.2.1 Valued Ecosystem and Socio-economic Components

As noted in [Section 4.2](#) of these EIS Guidelines, the EIS should include those valued ecosystem components (VECs) and valued socio-economic components (VSECs) (collectively the Valued Components (VCs), processes, and interactions between the VECs and VSECs that are likely to be affected by the Project and those identified in these Standard Guidelines. If relevant, the location of these VCs should be indicated on maps or charts, indicating to whom these components are valued and the reasons why, in terms of ecosystemic, social, economic, recreational, tourism, aesthetic or other considerations. The Proponent should also indicate the specific geographical areas or ecosystems that are of particular concern, and their relation to the broader regional environment and economy.

The NIRB has identified the following list of biophysical and socio-economic components that are typically relevant to projects in Nunavut. The Proponent should consider this list in the selection of the VCs. This list is; however, not comprehensive nor exhaustive, and provides an appropriate starting point only for the Proponent's identification of relevant VECs and VSECs.

Valued Ecosystem Components

- Air quality;
- Climate and Meteorology, including climate change;
- Noise and vibration;
- Terrestrial environment, including terrestrial ecology, geomorphology/landforms and soils;
- Permafrost and ground stability;
- Geology (including geochemistry);
- Hydrology (including water quantity) and hydrogeology;
- Groundwater and surface water quality, including surface runoff and snowmelt;
- Sediment quality;
- Freshwater aquatic environment, including:
 - aquatic ecology,
 - aquatic biota (including representative fish as defined in the *Fisheries Act*, aquatic macrophytes, benthic invertebrates, and other aquatic organisms)
 - habitat including fish passage and fish spawning areas;
- Vegetation;
- Terrestrial wildlife and wildlife habitat, including representative terrestrial mammals (i.e., caribou, muskoxen, wolverine, grizzly bears, wolves and less conspicuous species that may be maximally exposed to contaminants and the habitat, migration, and behaviour of these species) and wildlife migration routes (land and on-ice routes) and water crossings;

- Special attention to caribou, caribou calving and post-calving areas, migratory routes and current herd populations;
- Birds including raptors, migratory birds and seabirds, and their habitat;
- Marine environment, including:
 - marine ecology,
 - marine water and sediment quality,
 - marine biota including fish as defined under the *Fisheries Act* and benthic flora and fauna, and
 - marine habitat including fish habitat as defined in the *Fisheries Act*;
- Marine wildlife; and
- Species at Risk.

Valued Socio-Economic Components

- Economic development and opportunities;
- Employment;
- Education and training;
- Contracting and business opportunities;
- Benefits, royalties and taxation;
- Population demographics;
- Traditional activity and knowledge including harvesting (terrestrial wildlife and marine mammals), land use, food security, language, cultural, commercial harvesting and fishery, recreational fishery and Aboriginal fishery as defined in the *Fisheries Act*;
- Traditional seasonal travel routes;
- Non-traditional land use and resource use;
- Cultural, archaeological and palaeontological resources;
- Individual and community wellness, including family and community cohesion;
- Community infrastructure; public services, housing and community resupply;
- Governance and leadership; and
- Health and safety including worker and public safety.

The Proponent shall explain and justify methods used to predict potential adverse and beneficial effects of the Project on each VEC and VSEC, the interactions among these components, and the relations of these components with the environment. In particular, the Proponent must describe how the VCs were selected and what methods were used to predict and assess the adverse environmental effects of the Project on these components. The value of a component should be considered not only in relation to its role in the ecosystem as a VEC, but also the value placed on

that component by humans for traditional use and cultural connection as a VSEC. This should be considered not only for components of the environment but also the land directly affected by the Project. The Proponent shall provide a rationale for the selection of communities and relevant studies for which baseline data has been provided.

The Proponent should also validate the choice of VCs, especially those VCs that will be used to assess the significance of Project component interactions, through consultation with the potentially affected communities, government agencies, and other parties, and through incorporation of Inuit Qaujimaningit. All VCs used in the assessment should have clearly identified indicators or measurable parameters that provide a means to characterize a change in the VEC or VSEC as outlined in [Section 8.6.5](#).

The Proponent is expected to identify the components and activities of the Project that are anticipated to interact in adverse or beneficial ways with the selected VCs. These components/activities could be grouped into the following categories:

- Components and activities related to construction, operation, temporary closure, final closure (decommission and reclamation) and post-closure of the Project; and
- Components and activities induced by the Project development, which will occur in the reasonably foreseeable future.

8.1.2.2 Assessment Boundaries

Spatial Boundaries

The EIS shall define the spatial boundaries of the maximum area potentially affected by the Project, based on the boundaries for each individual type of impact. The spatial and temporal boundaries used in the environmental assessment may vary depending on the VC and will be considered separately for each component. The Proponent is encouraged to consult with the NIRB, federal and provincial government departments and agencies, local government and regional Inuit association, and take into account public comments when defining the spatial boundaries used in the EIS.

The EIS will describe the spatial boundaries, including local and regional study areas, of each VC used to assess the potential adverse environmental effects of the Project and provide a rationale for each boundary. The spatial boundaries of the assessment of the Project shall be determined based on the following criteria:

- The physical extent of project activities, including transportation routes;
- The extent of terrestrial and aquatic ecosystems and habitat potentially affected by the Project, taking into account factors such as watersheds, and the migratory and/or life cycle of wildlife species;
- Ecological flows and pathways (e.g., with respect to pollutant transport, bioaccumulation, noise);
- The communities potentially directly or indirectly affected by the Project;

- The extent to which traditional and contemporary land use (past, present, and future) and other harvesting could potentially be affected by the Project;
- The size, nature and location of past, present, and reasonably foreseeable projects and activities which could interact with the items listed above; and
- Potential ecosystemic or socio-economic impacts outside of Nunavut.

The following general spatial boundaries are suggested:

- **Site study area:** The site study area is the project footprint (i.e., where project activities would be undertaken including the Project's proposed facilities, buildings and infrastructure, transportation corridors, access roads, shipping routes).
- **Local Study Area (LSA):** the local study area is that area inclusive of, and beyond the site study area, where there exists the reasonable potential for immediate impacts due to project activities from any phase of the project, ongoing normal activities, or to possible abnormal operating conditions. The geographic boundary will depend on the factor being considered (e.g., a local study area defined for the aquatic environment will differ from that defined for the atmospheric environment).
- **Regional Study Area (RSA):** the regional study area is the area within which there exists the potential for direct, indirect biophysical and socio-economic effects of the Project that may interact with the effects of other projects, resulting in the potential for cumulative effects. The geographic boundaries for the regional study areas are also specific to the factor being considered and the area includes lands, communities, and portions of Nunavut and other regions of Canada that may be relevant to the assessment of wider-spread effects of the Project. The Proponent is advised to duly consider the transboundary implications of impacts to identified VCs as a result of air transportation, marine shipping, and road transport for the Project.

The EIS must contain a justification and rationale for all spatial boundaries and scales chosen. The LSAs and RSAs may vary between disciplines and between VCs, as they represent the likely distribution of Project effects on individual VCs. For example, a local study area defined for the aquatic environment will differ from that defined for the atmospheric environment, which will differ from that defined for archaeological studies. The Proponent is not required to provide a comprehensive baseline description of the environment at each of the above scales, but must provide sufficient detail to address the relevant environmental and cumulative effects of the Project.

Temporal Boundaries

Like spatial boundaries, temporal boundaries may vary with, among other things, the type of impact being considered and with seasonal changes. The establishment of temporal boundaries has two aspects: the time-horizon used to predict changes, and the temporal variability and periodicity that characterize the predicted impacts. The time-horizon used for predicting change must be a function of the anticipated duration of the Project; including the final closure and post-closure phases, the predicted impacts, and the predictive capability of the various disciplines at play.

The EIS shall determine the temporal boundaries separately for the construction, operation, maintenance, temporary closure (care and maintenance), final closure (decommission and reclamation) and post-closure periods. The temporary closure period (or care and maintenance) covers the period of untimely closure of the Project and includes care and maintenance activities; the final closure period covers decommission, and reclamation activities; and the post-closure period covers the period after the Project has been decommissioned and abandoned, and the site has been reclaimed and returned as much as possible to its natural state. The temporal boundaries of the post-closure period may encompass many years, depending on the site, the type of Project and the methods of closure. The Proponent shall also consider where applicable, the temporal bounds of Project alternatives under assessment, noting where they differ from those for the preferred option. As is the case for the determination of spatial boundaries, the temporal boundaries must indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects are presented.

For all temporal boundaries, the EIS shall give a rationale and justification for the boundaries chosen, including a description of any consultation with members of the public or technical experts. In doing so, the Proponent shall recognize the potential influence of climate change. For example, there may be no immediate danger of permafrost degradation, but the Proponent must incorporate the future possibility of this risk into the design of project components where applicable. The Proponent shall give due consideration to traditional and contemporary land use and occupancy (past, present, and future), in addition to other factors to be considered in its determination of temporal boundaries for the Project.

8.2 Public Consultation

As identified in [Section 2.2](#) of this document, the Proponent shall provide highlights of any public consultation and/or engagement undertaken and planned for the future as part of the EIS designed to address concerns of the general public regarding the anticipated or potential environmental effects of the Project. The EIS shall describe efforts made to distribute project information, as well as discuss information and materials distributed during public consultations. The EIS will indicate the methods used, where the consultation was held, the persons and organizations consulted, and how communication was facilitated with the public through accommodating regional languages/dialects; not only through translation but through live interpretation at community/public meetings.

A summary of key dialogues and identified issue areas from pre-consultation and consultation activities, along with any commitments made by the Proponent to communities during these discussions must be presented in the EIS.

The EIS must include a listing of concerns identified during consultations and discuss the extent to which information from consultation activities was incorporated into the design of the Project as well as in the EIS. The EIS will provide a summary of key issues raised related to the Project and its potential environmental effects, as well as describe any outstanding issues and ways to the Proponent proposes to address them. Specifically, the Proponent's EIS consultations should:

- Continue to provide up-to-date information describing the Project to the public, particularly residents of communities likely to be most affected by the Project;

- Involve the public in determining how best to deliver that information, i.e., the types of information required, translation and interpreting needs, timing of consultation, different formats, the possible need for community meetings; and
- Explain the findings documented within the EIS in a clear direct manner to make the issues understood by as wide an audience as possible.

8.3 Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge

The Proponent shall, with reference to [Section 2.3](#), present and justify its definition of Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge and shall explain the methodology used to collect this information including:

- Format and location of meetings;
- Description of background information provided at meetings;
- Level of community participation and composition of participants;
- Design of studies on Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge;
- Selection process for participants in such studies, including participants outside the Nunavut Settlement Area;
- Types of Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge collected; and
- Associated issues related to the storage and ownership related to Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge.

The Proponent shall summarize what kinds of Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge were collected and describe the roles and responsibilities of all concerned individuals and organizations in collecting, analyzing, interpreting and synthesizing this data. The Proponent shall also indicate whether special efforts were made to collect Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge from Inuit Elders, women or special groups, or harvesters familiar with the Project area.

In all sections of the EIS, the Proponent shall discuss how it weighed and incorporated Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge in areas such as baseline data collection, impact prediction, significance assessment, and the development of mitigation and monitoring programs. It shall explain how it integrated Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge and popular science, including the manner in which it reconciled any apparent discrepancies between the two. The Proponent shall also include a discussion on how it dealt with discrepancies within Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge (variation between individuals) and include incidences where Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge is being used to address gaps in currently available scientific data.

8.4 Description of the Environment and Baseline Information

The EIS will include a description of the environment, including the components of the existing environment and environmental processes, their interrelations and interactions as well as the variability in these components, processes, and interactions over time scales appropriate to the EIS. The EIS should include descriptions of existing conditions for all selected VCs. In characterizing the environmental effects of the project, the proponent will consider the current baseline environment and environmental trends within the project area, including Inuit Qaujimaningit, Inuit Qaujimajatuqangit, and Traditional and Community Knowledge in relation to the existing biophysical and socio-economic environments relevant to the assessment of potential impacts from the Project for all proposed phases. The description of the existing baseline and the environmental trends should include a consideration of past projects and activities carried out by the Proponent and/or others within the regional study area.

The Proponent shall explain methodologies for baseline data collection and analyses, evaluation of the adequacy of data, confidence levels associated with baseline data, and identification of significant gaps in knowledge and understanding. The associated uncertainties and the steps to be taken to fill information gaps should be discussed. The Proponent should consider other available information containing baseline data related to the Project region, including a review of published literature, technical scientific reports, and peer-reviewed scientific literature to present a complete picture of baseline conditions.

To identify natural fluctuations and trends including cyclical and other recurrent phenomena, the Proponent shall collect baseline data to reflect sufficient time, depth and geographic broadness of both temporal and spatial scale (e.g., populations and distributions of wildlife VECs are known to fluctuate in cyclic trends over extensive time periods and geographic ranges). In order to understand the natural ecological conditions and the potential impacts from the Project on these conditions, the Proponent should consider the design of all biophysical environmental monitoring programs to ensure that the baseline data required is useful in understanding the relationship between the natural ecological conditions and the potential Project impacts on these conditions.

Finally, the Proponent shall make any linkages explicit and describe the trade-offs. For example, deficiencies in baseline data increase uncertainties in the prediction of potential impacts, and consequently may require an intensification of corresponding monitoring and mitigation programs ([Section 10.3](#)), and follow up and adaptive plans ([Section 10.7](#)).

8.5 Study Strategy and Methodology

In describing the study methodologies, the Proponent shall explain how scientific, engineering, Inuit Qaujimaningit, Inuit Qaujimajatuqangit, traditional, community, and any other knowledge was used to construct its studies and reach its conclusions. Any assumptions shall be identified and justified and all conclusions presented shall be substantiated by the Proponent. All data, models, and studies must be documented so that the analyses are transparent and reproducible. All data collection methods shall be specified, and the uncertainty, reliability, and sensitivity of methods and models used to reach conclusions shall also be indicated.

To support the main conclusions presented in its EIS, the Proponent shall broadly identify significant gaps of knowledge and understanding, the steps taken by the Proponent to address these gaps, and how these gaps impacted those conclusions.

8.5.1 Acquisition Methodology and Documentation

The Proponent shall specify and justify all sampling protocols and statistical processes employed in both the biophysical and social contexts. The scope and reliability of the results, the possibility of reproducing the analyses, and quality control of laboratory analyses shall be analyzed. All data that is based on environmental sampling involves some variability, which must be determined in order to assess the scope and reliability of the data. The Proponent shall, for all data obtained from environmental sampling, provide a dispersion or variability coefficient (variance, standard deviation, confidence interval, etc.) and justification for sample size used.

When designing data collection or baseline studies, it is recommended that the Proponent coordinate with ongoing programs with relevant developments, government organizations, regional authorities, and researchers. This recommendation applies to data collected for the Nunavut General Monitoring Program, as per Article 12 of the *Nunavut Agreement*, the Proponent's project-specific monitoring programs, as well as any regional monitoring initiatives in which the Proponent currently participates or plans to participate.

8.5.2 Data Analysis and Presentation

Use of quantitative and qualitative criteria to describe the environment, compare various design and development options, or assess impacts, requires each criteria to be defined, their relative importance stated, and the differences between the categories (e.g., desirable, acceptable, unacceptable) indicated and justified. The Proponent shall corroborate all analyses, interpretations of results, and conclusions with a review of relevant literature, providing direct references with an indication of their public availability. Any Inuit Qaujimaningit, Inuit Qaujimajatuqangit, traditional knowledge or community knowledge references shall be indicated and sources identified, or referenced appropriately in cases where Inuit Qaujimaningit, Inuit Qaujimajatuqangit, traditional knowledge or community knowledge ownership or confidentiality concerns exist.

8.6 Impact Assessment Approach

The required impact assessment, including the significance analysis, should describe: the effect considered, the significance of the effect and justification for that determination; and if applicable, how the effect fits into a cumulative effects analysis and transboundary effects analysis. In this assessment, more emphasis should be placed on those significant impacts on the VCs, extending across all the Project phases if applicable. The biophysical elements and socio-economic elements potentially impacted by the Project components, activities and undertakings should be referred to in the categories listed in [Section 9.0](#). Based on the predicted potential adverse effects, the proposed mitigation measures shall be addressed in the corresponding management plans as listed in [Section 10.0](#).

The impact assessment for each VEC and VSEC can be linked to a list of project components and activities deemed responsible for the potential impacts. Vice versa, a project component or activity can also be linked to various environment elements, in particular VECs and VSECs, on which it might potentially have impacts. A matrix or a comparable tool should be employed to identify all linkages between environmental elements and project components and activities, highlighting those significant interactions between both.

8.6.1 Impact Prediction

The Proponent shall assess the direct, indirect, short-term, and long-term impacts of the Project on the ecosystemic and socio-economic environments, and the interactions between them, focusing on the anticipated response of the VCs. The Proponent shall provide a discussion on how the predicted changes or impacts compare to existing/baseline conditions. The Proponent shall also assess the degree of uncertainty associated with each predicted effect. Where potential cumulative effects are identified, a discussion should be provided related to the cumulative effects assessment as outlined in [Section 8.6.3](#) of these guidelines.

The Proponent shall identify potential impacts resulting from each Project phase, including impacts arising from accidental events and malfunctions, with accepted practices used to draw impact predictions. Predictions shall be presented with appropriate explanations and justification, and the Proponent shall:

- Explain how scientific, engineering, and Inuit Qaujimaningit, Inuit Qaujimajatuqangit, traditional knowledge, and community knowledge was used;
- Document and justify study methodologies, including mathematical or numerical modeling and statistical analyses;
- Support analyses, interpretation of results and conclusions with reference to appropriate literature;
- Document assumptions and limitations of data collection and analyses, and describe how uncertainty in impact predictions have been dealt with;
- Specify and reference sources for any contributions based on Inuit Qaujimaningit, Inuit Qaujimajatuqangit, traditional knowledge, and community knowledge;
- Identify which studies included the assistance of communities and individuals, who was involved (if the information can be made public), and how participants were selected;
- Identify all proposed mitigation measures and adaptive management strategies, if applicable; and
- Describe or characterize the potential residual effects.

8.6.2 Impacts of the Environment on the Project

The Proponent shall discuss the potential impacts of the environment on the Project, considering such factors as:

- Geotechnical hazards (including slope and underground instability, differential or thaw settlement, frost heave, ice scour and seismic activity);
- Unfavourable geological conditions (weak zones and/or faults);
- Permafrost (ground instability related to permafrost thaw and artesian groundwater pressure due to permafrost confinement);
- Severe weather events (extreme precipitation events, flooding, storm surges etc.); and
- Sea ice conditions, sea level trends, subsidence and global climate change.

The discussion on global climate change must describe and assess, on the basis of current knowledge, how potential climate change could affect permafrost and soils with high ice content, the hydrological regime, the groundwater regime, as well as marine ice flow regimes, and the long-term impacts of such changes on Project infrastructure (i.e., water diversions and impoundment structures, waste water treatment structures, fuel and chemical storage areas, solid waste sites, road structures, waste management facilities, etc.). In addition, the Proponent shall identify the Project's sensitivity to changes in specific climate-related parameters ([CEAA, 2003](#)). The discussion on climate change should include:

- Effects of climate on the Project, with a focus on the design and planning of Project components and activities;
- Impacts of extreme meteorological events on the Project, and related considerations for Project design and planning, including, but not limited to, the following: extreme temperature and precipitation events; high winds and waves; ice-ride up and pile-up events; extreme ocean water levels (high and low); and severe fog or white out conditions. Potential changes to the timing of ice formation, active layer thickness, and frequency of storms should also be taken into consideration;
- Design and apply multiple scenarios on impacts assessment, where these scenarios span the range of possible future climates, rather than designing and applying a single “best guess” scenario ([CCDS, 2018](#)). It is recommended that the range of future climates considered by the Proponent up to date scenarios, such as those used in the Arctic Climate Impact Assessment report ([ACIA, 2005](#)) as well as those in the relevant Intergovernmental Panel on Climate Change assessments for polar regions ([IPCC, 2018](#));
- Impacts from climate change on sensitive ecosystem features within the terrestrial and marine ecosystems;
- Predicted effects of climate change on mean and extreme climate parameters, and meteorological phenomena including flooding, storms, etc.
- Potential effects of climate change on permafrost thawing in the Project area, with discussion of the related implications on the stability of project components (e.g., waste management facilities) and sensitive land features (e.g., Canadian Heritage River, territorial or national park), including waste management facilities; and
- Uncertainties related to climate change predictions, and the related effect on other predictions in the EIS, including water quantity and permafrost thawing.

Longer-term effects of climate change must also be discussed up to the projected closure phase of the Project. The sensitivity of the Project to long-term climate variability and effects shall be identified and discussed. The Canadian Environmental Assessment Agency Procedural Guide, “*Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*” ([CEAA, 2003](#)) should be consulted for guidance as to how climate change considerations should be incorporated into the EIS.

8.6.3 Cumulative Effects Assessment

A cumulative impact (or effect) can be defined as the impact on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions ([Tilleman, 2005](#)). Cumulative impacts can also result from individually minor, but collectively significant, actions taking place over a period of time.

The Proponent is expected to carry out its cumulative effects assessment (CEA) on the basis of the following:

- *A larger spatial boundary (RSA rather than LSA):* This will enable the Proponent to assess the project impacts in relation to other activities (including other projects) in the geographical region, and implies that spatial assessment boundaries may cross jurisdictional boundaries for a better understanding of additive and interactive pathways of different types of cumulative effects ([NIRB, 2007](#));
- *A longer temporal scale (as defined in [Section 8.1.2.2](#)):* This will enable the Proponent to consider all activities from past developments into the present time and the reasonably foreseeable future for a more accurate analysis of variability and significant long-term effects;
- *Alternatives analysis:* CEA requires the explicit creation of alternative development scenarios and analysis of potential cumulative effects associated with each option ([Greig et al., 2002](#)). Therefore, the CEA should address the alternatives presented under [Section 7.5](#) of these guidelines;
- *Consideration of effects on the VCs:* The CEA should enable the Proponent to more accurately assess how the interaction of impacts from the various Project components and activities, and those from other past, present and reasonably foreseeable projects (including mineral exploration), might impact in a cumulative fashion on selected VCs; and
- *Evaluation of significance:* The CEA should identify and predict the likelihood and significance of potential cumulative effects, including direct, indirect and residual impacts. The Proponent shall consider and determine the significance of the cumulative effects using the criteria described in [Section 8.6.6](#).

On this basis, the Proponent shall:

- Justify the environmental components that are the focus of the CEA. The Proponent’s assessment should emphasize the cumulative effects for those VCs that could potentially be most affected by the Project;

- Present a justification for the spatial and temporal boundaries for the CEA, (recognizing that these boundaries can vary depending on the VCs assessed). The Proponent shall give due consideration to the potential for cumulative effects that may be transboundary;
- Discuss and justify the choice of projects, components and selected activities for the CEA. These shall include past activities and projects, those currently being carried out and any reasonably foreseeable project or activity. Activities should not be limited to transportation or exploration and mining-related activities but include other factors not related to transportation or mining (e.g., wildfires, roads/airstrips developed for non-mining activities, etc.); and
- Discuss the mitigation measures that are technically and economically feasible, and determine the significance of the cumulative effects. If any impact is identified and verified beyond the Proponent's sole responsibility or capacity, the Proponent shall make best efforts to identify other responsible parties that may contribute collectively to mitigating the impact.

8.6.4 Transboundary Impacts

Transboundary impacts, for the purpose of the EIS Guidelines, are defined as those effects linked directly to the activities of the Project inside the Nunavut Settlement Area (NSA), which occur across provincial, territorial, international boundaries or may occur outside of the NSA. The Proponent shall give due consideration to the potential for transboundary impacts which may be a result from interactions between the effects of the Project in the NSA, and the effects of projects located outside the NSA. As noted above, the potential for transboundary impacts related to cumulative effects associated with this Project shall also be defined.

Where feasible, the potential for transboundary impacts should be considered for all VCs identified by the Proponent, with specific consideration given to the potential for transboundary impacts associated with marine shipping on marine mammals, migratory birds and seabirds, and their habitat, as well as the large migration range of land mammals such as caribou. Any residual effects which have the potential to occur outside of the NSA shall also be included in the Proponent's evaluation of transboundary impacts.

Due to the nature of the project being a proposed road connecting a port on the coast to the Tibbitt-Contwoyto Ice Road, the Proponent shall give due consideration to effects arising from potential increases or changes in the usage of the ice road resulting from shipping to and from the port which may affect VCs within and outside of the NSA.

8.6.5 Indicators and Criteria

The Proponent shall identify the indicators and criteria selected for assessing the potential impacts of the Project, including any cumulative and transboundary impacts, and shall justify their selection. In doing so, the Proponent shall describe the role played by consultation with members of the public, Inuit Qaujimaningit, Inuit Qaujimajatuqangit, traditional knowledge and community knowledge and technical experts. In its discussion of indicators, the Proponent shall emphasize the linkage between those indicators and the relevant VCs. The indicators for the

VECs should include sensitivity to contaminants and environmental pathways of exposure and bioaccumulation.

8.6.6 Significance Determination

Impact significance is based on comparing the predicted state of the environment with and without the Project and expressing a judgment as to the importance of the changes identified. Assessing the significance of potential impacts is, arguably, the single most important aspect of an environmental impact statement.

In the process of significance determination, the Proponent is expected to communicate with potentially affected communities, including relevant individuals and organizations to solicit input and incorporate their views regarding the value placed on a VEC or VSEC, as well as associated significance of impacts. The Proponent shall describe how it will determine the significance that different parties assigned to each impact, and how it will proceed if different parties ascribe varying significance to VECs, VSECs, or the associated impacts. If it is impossible to attain a consensus on the significance of certain impacts, the Proponent shall present the range of viewpoints expressed and shall present and justify its preference, if any. Finally, the Proponent shall describe the significance it ascribes to each effect, and justify how the significance of the effect was determined.

The dynamic change of ecosystems and their components must also be considered in determining impact significance. The Proponent shall evaluate the significance of potential impacts in the light of data on the current “state of health” of ecosystems and their predictable evolution, while taking into account global climate change. Consistent with the ecosystem approach required above, the Proponent should highlight the interactions within and between ecosystem components in an effort to increase understanding of the dynamism of the ecosystems in question and the nature and severity of the predicted impacts.

The terms used to describe the level of significance, such as "low", "medium", "high", “adverse”, “beneficial”, “positive”, “negative” must be clearly defined, where possible in quantitative terms. The following attributes defined by the NIRB shall be taken into consideration in determining the significance of each impact:

- Direction or nature of impact (i.e., positive/beneficial versus negative/adverse);
- Magnitude and complexity of effects;
- Geographic extent of effects;
- Frequency and/or duration of effects;
- Reversibility or irreversibility of effects; and
- Probability of effects.

In addition, the NIRB considers other relevant attributes in assessing the significance of impact:

- Ecological or socio-economic context/value;
- The environmental sensitivity of the area likely to be affected by the project;

- The historical, cultural and archaeological significance of the geographic area likely to be affected by the project;
- The size of the affected human populations, and the size of the affected wildlife populations and related habitat;
- The extent of the effects of the project on other regional human populations and wildlife populations, including the extent of the effects on Inuit harvesting activities;
- The potential for cumulative adverse effects given past, present and future relevant events;
- Effects on ecosystem function and integrity;
- The effect on the capacity of resources to meet present and future needs;
- The value attached to the impacted VC by those who identified them; and
- The relative sensitivity of a VEC to impacts, e.g., higher sensitivity of species at risk.

8.6.7 Certainty

The Proponent shall also assess the degree of uncertainty or confidence associated with each predicted effect. The level of certainty with predictions is related to limitations in the overall understanding of the ecosystem and limitations in accurately foreseeing future events or conditions. The Proponent shall provide a reasonable description how uncertainties have been dealt with, through elements such as project design, monitoring and contingency plans.

9.0 PROJECT ENVIRONMENT AND IMPACT ASSESSMENT

The EIS shall provide a complete analysis of the predicted effects from the Project on the biophysical and socio-economic environments (see [Section 8.0](#)), and will serve as a basis for developing various mitigation and monitoring plans to eliminate and/or minimize the potential impacts from the Project.

9.1 Biophysical Environment and Impact Assessment

The Proponent shall present relevant information pertaining to the biophysical environment and associated processes to be assessed (see [Section 8.4](#)), to serve as a baseline against which the potential impacts of the Project can be measured. Information should be presented in the form of a “Conceptual Site Model” with clear links to ecological and human health risk assessment presented throughout the document. Baseline summaries should also include trends and how the environment is expected to change over the life of the Project.

In describing the biophysical environment, the Proponent shall take an ecosystemic approach that takes into account both scientific and Inuit Qaujimaningit perspectives regarding ecosystem health and integrity.

In its impact assessment, the Proponent should identify and justify the indicators and significance thresholds, and further relate them to Project monitoring and follow-up measures. For each predicted negative impact in this section, associated mitigation measures should be discussed to the extent possible, with references to project design ([Section 7.1](#)) and environmental

management systems ([Section 10.0](#)). The Proponent should also include a treatment on the temporal aspect of when potential impacts on each relevant VEC could reasonably be expected to manifest.

9.1.1 Air Quality

9.1.1.1 Baseline Information

- a) Collect background ambient air quality data in the LSA and RSA;
- b) Determine current sources of criteria air contaminants and greenhouse gases (GHG) emissions; and
- c) Identify seasonal variations or climatic conditions associated with variations on air quality.

9.1.1.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis on air quality for all Project components and activities during all phases. This analysis shall:

- a) Discuss standards, guidelines and regulations that will be incorporated to minimize and mitigate effects to air quality;
- b) Predict the following air contaminants from all components and activities of the Project at all phases:
 - i. Criteria air contaminants;
 - ii. GHG;
 - iii. Fugitive dust; and
 - iv. Gaseous pollutants.
- c) Assess the dispersion of emissions within the LSA and RSA using appropriate modelling and discuss related impacts and provide mitigation strategies;
- d) Assess effects on air quality due to emissions from all Project components and activities during all phases;
- e) Assess the Project's GHG contributions to both Nunavut and Canada; and
- f) Discuss the potential effects of changes in air quality on human health and the environment.

9.1.2 Climate and Meteorology, including Climate Change

9.1.2.1 Baseline Information

- a) Describe the baseline meteorological and climatic conditions at the LSA and RSA;
- b) Collect meteorological data including, but not limited to, air temperature, precipitation, wind directions and velocity, as well as prevailing wind directions for locations of proposed project components and along proposed transportation route(s); and
- c) Determine annual, seasonal, monthly and daily average and mean values of above noted meteorological parameters as well as their seasonal and yearly fluctuations and

variability, and identify the occurrence of extreme climate events over the same period of time in which the data is collected in the RSA of the Project.

9.1.2.2 Impact Assessment

The Proponent is required to present a comprehensive analysis of the impact that all components of the Project and activities may have on climate and meteorology. This analysis shall:

- a) Discuss the relationship between climate change and GHG emissions due to the Project; and
- b) Discuss all climate parameters that may change due to emissions from the Project.

9.1.3 Noise and Vibration

9.1.3.1 Baseline Information

- a) Describe the baseline noise and vibration levels in the Project area. Include a discussion on variability and if applicable, the relationship between these parameters and local weather conditions, seasonal variations;
- b) Review available studies/research on the potential impacts of noise and vibration on wildlife behaviour and health in both terrestrial and aquatic environments, including a focus on noise from similar developments in comparable climate and geographical regions if possible, with an emphasis on the level of noise and the identification of noise-sensitive species and timing; and
- c) Review available studies/research on the potential impacts of noise and vibration from blasting in or near the aquatic environment.

9.1.3.2 Impact Assessment

The Proponent is required to present a comprehensive analysis of potential noise and vibration impacts that all Project components and activities may have in the RSA and LSA. This analysis shall:

- a) Discuss standards, guidelines, thresholds and regulations that the Proponent will comply with to minimize and mitigate impacts associated with noise and vibration;
- b) Quantify the potential increase to atmospheric noise and vibration levels from all Project activities and components during all phases;
- c) Discuss potential changes in marine and freshwater noise and vibration levels due to shipping activities (if any), as well as noise and vibration propagation in the marine and freshwater environment; and
- d) Discuss potential impacts of noise and vibration on the following:
 - i. Humans and human activity in close proximity to noise generating sources;
 - ii. Terrestrial wildlife (including birds and Species at Risk);
 - iii. Marine mammals; and
 - iv. Fish in freshwater and marine environments.

9.1.4 Terrestrial Environment

For the purpose of the current Guidelines, terrestrial environment includes terrestrial ecology, geomorphology/landforms, soils, permafrost and ground stability.

9.1.4.1 *Baseline Information*

- a) Describe the existing unique or valuable landforms (e.g. eskers, fragile landscapes, wetlands), including details regarding the ecological functions and distribution in the LSA of each;
- b) Describe the existing and/or proposed protected areas, special management areas, and conservation areas in the RSA;
- c) Discuss landforms and topographic features at areas proposed for construction of major Project components, including the type, thickness, soil stability and/or clay sensitivity, and classification and distribution of soils as applicable;
- d) Describe bedrock lithology, morphology, surface geology, landform and soils for all areas of the Project where earthworks are proposed. If eskers are identified as a potential source of granular material, provide a description of granular material properties, including thermal condition and ice content;
- e) Discuss the potential of geohazards that may have an effect on the project or the occurrence of which may potentially be affected by the Project (e.g., slumping, landslides, potential slippage, seismic hazards) at all areas planned for Project facilities and infrastructure;
- f) Discuss the relationship between permafrost processes and the active layer, surface waterbodies and topography, including a description of permafrost and talik configuration in Project areas and a discussion of implications for groundwater flow pathways;
- g) Describe permafrost distribution in the LSA especially in areas of discontinuous permafrost, high ice-content soils, ice lenses, thaw-sensitive slopes, and talik zones;
- h) Describe permafrost temperatures at areas planned for Project facilities and infrastructure. Discuss the sensitivity of permafrost to climate change and its implications for stability and safety of infrastructures; and
- i) Identify sites of paleontological significance within the LSA.

9.1.4.2 *Impact Assessment*

The Proponent is required to present a comprehensive analysis of the impact that all Project components and activities may have on the terrestrial environment. This analysis shall:

- a) Discuss the impact on topography in the LSA as a result of Project development with a focus on sensitive landforms and those serving as important vegetation and wildlife habitat;
- b) Determine potential impacts on the abundance and distribution of unique or valuable landforms due to the Project;
- c) Discuss the potential for soil erosion, resulting from surface disturbances associated with relevant Project components and activities during all phases;

- d) Discuss potential impacts to soil quality due to all Project components and activities during all phases;
- e) Describe the implications to Project planning and design of project components related to terrestrial conditions (e.g., permafrost, sensitive landforms, high ice-content soils, ice lenses, thaw-sensitive slopes, talik zones);
- f) Discuss potential impacts on terrestrial stability, especially thermal stability due to the thawing of ice-rich permafrost soils and other sensitive landforms due to all relevant Project components and activities during all phases;
- g) Discuss whether country foods are consumed or are expected to be consumed in the potentially affected area;
- h) Identify what country foods are consumed, which parts of country foods are consumed and their consumption frequency;
- i) Determine potential impacts on contamination of country foods harvested, grown for subsistence or used for medicinal purposes. Investigate the potential of contamination due to bioaccumulation;
- j) Discuss potential impacts from the loss or alteration of terrestrial and aquatic habitat due to the Project and its related effects to wildlife and aquatic species;
- k) Discuss the potential for the occurrence, frequency and distribution of terrain hazards (e.g., snow drifts, snow banks) due to all Project components and activities during all phases.

9.1.5 Geological Features, Surficial and Bedrock Geology and Geochemistry

9.1.5.1 Baseline Information

- a) Describe local and regional bedrock and quaternary geology, and provide the history of the geological formations and the description of their physical, chemical, and hydrogeological properties. Provide maps for data obtained with in-situ investigations, showing the location of any earthworks or drilling and indicate their positions relative to the planned Project component;
- b) Describe the structural geology (e.g., fractures, faults, etc.) at major Project infrastructure areas and where earthworks are proposed;
- c) Describe the typical regional and local cross-sections of the general geology showing the geological units and their elevation, groundwater table and linear geological structures;
- d) Describe the geotechnical properties of bedrock and soil units, specifically ice content and thermal conditions of permafrost soils and rocks as it relates to slope stability, underground stability and bearing capacity of facility foundations; and
- e) Quantify in-situ stress either with in-situ investigations or from other sources with reasonable confidence.

9.1.5.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities on geology. This analysis should:

- a) Identify potential geotechnical and geophysical hazards within the Project area. Include information on:
 - i. Potential seasonal subsidence;
 - ii. Seismicity and faulting;
 - iii. Risks associated with cut/fill slopes;
 - iv. Underground excavation; and
 - v. Surface constructed facilities.

Where appropriate, supplement the assessment by analysis and illustrations such as maps, figures, cross sections and borehole logs;

- b) Determine potential effects on foundation stability of major Project components from geological fractures and faults and discuss the associated implications of these features on project planning and engineering design; and
- c) Discuss results of risk assessment and predictions and include proposed management measures.

9.1.6 Hydrological Features and Hydrogeology

9.1.6.1 Baseline Information

- a) Describe the hydrology of the LSA (e.g., streams, surface water flows, subsurface water movement, ice formation and melt patterns);
- b) Describe the relevant hydrological regimes, drainage basins, watershed boundaries and site water balance in the RSA;
- c) Describe natural fluctuations, variability and sources of variability in flow rates. Include seasonal fluctuations and year-to-year variability and the interactions between surface water and groundwater flow systems;
- d) Describe the timing of freeze/thaw cycles, flood zones, ice cover (seasonal patterns and spatial variation), ice conditions, typical ice thicknesses, ice formations and melt patterns;
- e) Describe the hydrological characteristics of streams, rivers, and lakes in each watershed of the RSA. These hydrological characteristics are to be considered within the context of the expected range of climate conditions;
- f) Provide a conceptual and numerical hydrogeological model that discusses the hydrostratigraphy and groundwater flow systems;
- g) Characterize faults and fractures within the Project area. Include information about occurrence, hydraulic conductivity testing and interpretation;
- h) Describe interactions between permafrost, surface water and ground water and topography as well as rock fractures and talik zones between different surface/ground waters;
- i) Describe permafrost/talik distribution, permeability and hydraulic conductivity of the underlying materials; and
- j) Describe existing groundwater regimes, distribution characteristics and flow paths in the Project area.

9.1.6.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities during all phases on hydrology and hydrogeology. This analysis should:

- a) Discuss the potential impact of variable and extreme stream-flows on Project design and planning;
- b) Discuss the potential impacts to existing watersheds due to all Project components and activities during all phases;
- c) Discuss potential impacts to natural drainage patterns due to all Project components and activities during all phases;
- d) Discuss potential impacts on terrestrial and aquatic wildlife habitat resulting from the modification or redirection of natural flows;
- e) Discuss the potential for ice damming and resultant effects on other resources;
- f) Assess the navigability and safety of the waterbodies related to all Project components and activities during all phases;
- g) Determine potential changes to permafrost and ground ice conditions as a result of all Project components and activities during all phases; and
- h) Determine potential changes to permafrost/talik distribution, groundwater distribution and flow paths; and
- i) Determine the potential impacts of the outflow of water from the tailrace(s) to the quality and quantity of ice on the waterbodies within the LSA.

9.1.7 Groundwater and Surface Water Quality

For the purpose of the current Guidelines, groundwater and surface water quality includes surface runoff and snowmelt.

9.1.7.1 Baseline Information

- a) Identify all sources of drinking water (surface and groundwater) as well as water used for recreational purposes within the area of influence of the Project;
- b) Describe the natural hydrogeochemistry of the groundwater system;
- c) Describe the physical and chemical characteristics of groundwater and surface water in the LSA. Provide discussion on seasonal variations of water flow and quality. Discussion on chemical characteristics should include baseline levels of contaminants and should be compared to relevant water standards/guidelines with identification of those which are naturally elevated;
- d) Discuss the importance of the waters in the LSA with regards to local harvesting activities and boating/navigation by surrounding communities;
- e) Describe the lake bathymetry and limnology in the LSA;
- f) Provide an outline of baseline water quality conditions within the watershed and the project area. Include a summary of baseline data collected with summary statistics and identified detection limits;

- g) Provide maps and cross-sections of the study area indicating the extent of hydrostratigraphic units, permafrost and Lake Taliks. Include groundwater levels, potentiometric contours and groundwater flow directions;
- h) Provide the location and description of all on-site groundwater monitoring wells (e.g. well diameter, screen depth, intercepted aquifer unit, etc.). Include all baseline groundwater level data;
- i) Provide hydraulic conductivity data for hydrogeologic units in the study area;
- j) Provide a detailed groundwater budget; and
- k) Include a discussion of groundwater interactions with surface waterbodies in the area.

9.1.7.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities during all phases on groundwater and surface water quality. This analysis should:

- a) Identify and provide details on the specific contaminants of potential concern to the Project, the project activity to which they are related, the rationale for selecting them and for determining which will be carried forward into the impact assessment. Discuss contaminants by including figures showing potential sources of contaminants with approximate distances from surface water and the likely flow path in the event of a release. Provide predictions on how the identified contaminants may interact (synergistically or antagonistically);
- b) Provide predicted increases in contaminants in groundwater and surface water as a result of the Project, specifically identifying any waterbodies used as drinking water sources, for recreational purposes, important local harvesting locations and the fish bearing status of identified waterbodies. For any water sources identified as being current or future drinking water sources, compare concentrations of contaminants to relevant territorial drinking standards/guidelines and/or Health Canada Drinking Water Guidelines (Health Canada, 2010);
- c) Determine potential impacts on groundwater and surface water quality in all affected lakes, rivers and streams due to all Project components and activities during all phases;
- d) Discuss potential impacts on water quality due to water withdrawals;
- e) Discuss the potential for increases in suspended sediments (or other solids) in waterbodies due to all Project components and activities during all phases;
- f) Outline proposed surface water quality objectives to maintain within the watershed and Project area throughout the life of project. Outline anticipated impacts (and cumulative effects) to surface and groundwater quality in the watershed.

9.1.8 Sediment Quality

9.1.8.1 Baseline Information

- a) Describe the physical and chemical characteristics of sediment in the LSA and RSA;
- b) Describe sedimentation rates and dispersion patterns in waterbodies (freshwater and marine) of the LSA and RSA;

- c) Provide flow models and sediment dispersion models to outline the rate and location of sediment deposition where relevant. Link this baseline information with hydrology baseline information ([Section 9.1.6.1](#));
- d) Identify and describe the baseline levels of contaminants in sediment in the LSA and RSA, compare contaminant levels to relevant sediment standards/guidelines and identify any contaminants that occur at naturally elevated levels; and
- e) Provide discussion on seasonal variations in sediment quality.

9.1.8.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities during all phases on sediment quality. This analysis should:

- a) Discuss potential impacts on freshwater and marine sediment quality due to all Project components and activities during all phases;
- b) Discuss fluvial processes and stability;
- c) Determine potential sedimentation and infill rates of drainage areas that might be impacted by the Project;
- d) Determine potential impacts of erosion due to all Project components and activities during all phases; and
- e) Discuss the potential impacts on sedimentation patterns and subsea permafrost due to Project components and activities during all phases.

9.1.9 Aquatic Environment

For the purpose of the current Guidelines, the aquatic environment includes the freshwater and marine environment.

9.1.9.1 Baseline Information

- a) Describe the limnology, marine physical processes, freshwater and marine biological diversity and composition, and associated interactions in the LSA and RSA;
- b) Describe sea-ice conditions in the area of Grays Bay and the proposed marine shipping corridors including:
 - Timing of freeze-up and break-up,
 - Usage of ice by wildlife (terrestrial and marine), and
 - Potential interactions or disruptions due to shipping and/or port activities;
- c) Describe the presence of fish and other freshwater and marine species, associated habitat and habitat distribution in the LSA and RSA with emphasis on species that perform particularly significant ecological functions and/or are of importance to Inuit life and culture;
- d) Emphasize identified VECs and species with special designations (e.g., Species at Risk listed on Schedule 1 of the federal *Species at Risk Act* (SARA) and species with designations by the Committee on the Status of Endangered Wildlife in Canada [COSEWIC]) or any rare or regionally unique species and corresponding habitats within

the LSA and RSA. Additionally, clams are a locally important marine species and should be included as a VEC in the EIS for the proposed Project;

- e) Characterize the habitat requirements for each fish species and identify areas used for spawning, rearing, feeding and over-wintering as well as the sensitive timeframes for these activities;
- f) Identify marine wildlife species, historical and current habitat, seasonal migration patterns, critical areas for feeding, calving, nursing, over-wintering, etc. and determine potential interactions between any Project activities and components during all phases;
- g) Describe the freshwater (and marine, if relevant) habitat in waterbodies and watercourses within the LSA including littoral zones, aquatic and riparian vegetation, lake bottom characteristics, key habitat areas, estimated productive capacity, etc.;
- h) Discuss the health of freshwater and marine VEC indicator species and their contaminant loadings;
- i) Describe the biological composition of freshwater and marine environments in the LSA, including: trophic state, periphyton, phytoplankton, zooplankton, benthic invertebrates, fish, marine mammals and the interactions and relative significance of each trophic level identified in the food chain;
- j) Determine the population distribution of fish species in the LSA with a focus on arctic char, lake trout, arctic grayling and other species identified as contributing to Aboriginal, recreational or commercial fisheries as well as key forage fish for these species. Include baseline information on the abundance and distribution of these species; and
- k) Discuss any other issues relating to freshwater and marine species or habitat identified through public consultation.

9.1.9.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities during all phases on the aquatic environment, which includes the freshwater and marine environments. This analysis should:

- a) Discuss all potential risks and impacts to the marine and freshwater ecosystem due to Project activities and components during all phases;
- b) Determine the potential loss to or deterioration of sea-ice conditions in the area of Grays Bay due to all Project activities and components during all phases;
- c) Determine potential loss to or deterioration of the habitat of freshwater and marine VECs due to all Project activities and components during all phases. Focus on Species at Risk listed on Schedule 1 of the federal SARA, species with designations by the COSEWIC, species having significant ecological functions and/or of importance to Inuit life and culture;
- d) Determine the potential direct and indirect impacts to freshwater and marine fish, marine wildlife and other species of concern as it relates to behaviour, distribution, abundance, migration patterns, species health and reproduction due to all Project activities and components during all phases;
- e) Discuss the potential for spills, malfunctions and other accidents associated with the Project and the resulting impacts to freshwater and marine species;

- f) Determine the potential impacts on identified freshwater and marine species' habitat critical for spawning, rearing, nursing and feeding, seasonal migration, winter refuges and migration corridors;
- g) Evaluate the ability of fish to pass at crossings and/or diversion sections taking into consideration periods of extreme low and extreme high stream flows;
- h) Determine the potential impacts to freshwater and marine species health, distribution and population. Evaluate the potential for contaminants to be released to the environment and taken up by VECs as a result of the Project and the potential impact to human health due to consumption of these species;
- i) Determine the potential impacts of contamination of traditional foods as a result of bioaccumulation and discuss proposed monitoring of these impacts;
- j) Discuss management measures to minimize/mitigate disturbances to fish populations and describe measures to reduce the potential for establishment of any invasive aquatic species in the area;
- k) Discuss the ecological, physical and/or climatic factors that would increase the exposure of freshwater and marine species to harmful substances and/or adverse conditions;
- l) Provide a quantitative assessment of the ecological risks to aquatic (freshwater and marine) VECs from the potential elevated contaminant loadings as a result of the Project;
- m) Assess the potential residual and cumulative effects on freshwater and marine VECs resulting from all Project activities and components during all phases;
- n) Assess the risk of the potential for introduction of non-native aquatic species as a result of the Project;
- o) Determine the potential impacts to freshwater and marine sediment quality due to Project components and activities during all phases;
- p) Determine the potential impacts to shoreline stability and sensitive aquatic habitat (e.g., coastal wetlands) due to Project components and activities during all phases;
- q) Discuss the potential impacts to marine water quality due to all Project components and activities during all phases; and
- r) Discuss the potential impacts of climate change and sea level change on the Project.

9.1.10 Vegetation

9.1.10.1 Baseline Information

- a) Describe the ecological zones and other relevant classifications of plant associations and phenology in the LSA;
- b) Describe the vegetation/plant types in the LSA. Provide information on the estimated percentage cover and height for principal species and discuss their significant ecological functions and/or their importance to wildlife and humans;
- c) Provide an overview of vegetation species, population and distribution in the RSA. Focus on identified vegetation VECs and species with special designations (Species at Risk listed on Schedule 1 of the federal SARA and species with designations by the COSEWIC). Include references to species having significant ecological functions, and/or

of importance to Inuit life and culture (i.e. Inuit Qaujimaningit and Traditional Knowledge related to plants and plant use in the RSA);

- d) Provide details regarding associations between vegetation cover and soil types in the LSA;
- e) Present available published information and/or information resulting from Inuit Qaujimaningit and Traditional Knowledge studies on identified VECs;
- f) Discuss the health status of plant species or communities in the LSA. Include baseline information on contaminant levels in representative species consumed by wildlife and/or humans, either directly (humans eating plants) or indirectly (humans consuming wildlife), as well as other vegetation to demonstrate vegetation sensitivity to contaminants and the potential of bioaccumulation in the ecosystem; and
- g) Discuss any other issues related to vegetation as identified through public consultation.

9.1.10.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities during all phases on vegetation. This analysis should:

- a) Determine potential impacts to abundance, diversity, coverage, quality, composition and distribution of vegetation in the RSA due to all Project activities and components during all phases;
- b) Assess the potential loss, disturbance and/or changes to vegetation abundance, diversity, and forage quality in the RSA as a result of Project components and activities. Include the potential effects from air pollutants, changes to water quality and quantity, permafrost or snow accumulation in the assessment;
- c) Determine potential impacts on vegetation abundance and diversity from the transfer/introduction of invasive or exotic species into the LSA due to the Project;
- d) Discuss proposed methods for vegetation monitoring, specifically contaminant levels in species directly consumed by wildlife (e.g., lichen) and/or humans (e.g., Labrador tea, blueberries) and/or indirectly consumed through food consumption; and
- e) Discuss management measures to minimize/mitigate disturbances to vegetation (i.e., progressive reclamation/re-vegetation plans for disturbed areas) and measures to reduce the potential for establishment of invasive species in the LSA.

9.1.11 Terrestrial Wildlife and Wildlife Habitat

9.1.11.1 Baseline Information

- a) Identify terrestrial wildlife species that reside within or occasionally use the habitat within the RSA. Focus on terrestrial wildlife that have been identified as VECs and SARA Schedule 1 “species at risk” and any species designated as “special concern”, “threatened”, or “endangered” by COSEWIC. For each species, identify the habitat use within the RSA, identify the typical home range of the species, and delineate the subpopulation boundaries of the individuals that use the RSA. List the species in rank order determined by conservation status, VEC, importance to ecosystem function, and importance to Inuit life and culture; ;

- b) Describe the biodiversity within the RSA and associated food chain relationships among terrestrial wildlife species;
- c) Present available published information and/or information resulting from Inuit Qaujimaningit and Traditional Knowledge studies regarding identified VECs. Include information on:
 - i. Relative seasonal and annual trends in abundance and distribution within the RSA;
 - ii. Estimated productive capacity within the RSA;
 - iii. Migratory patterns and associated corridors/routes;
 - iv. Critical habitats in the LSA and RSA; and
 - v. Sensitive time periods for species within the RSA.
- d) Include information on any disease, parasite or contaminant loads that could be affecting the health of any VEC or species at risk. Indicate whether any existing diseases, parasites or contaminant loads are a risk factor for humans;
- e) Describe subpopulation trends (if any) of identified VECs within the RSA;
- f) Provide details regarding habitat within the LSA which are important for forage, shelter and reproduction of wildlife VECs;
- g) Identify key wildlife habitats in the LSA and RSA as applicable, namely:
 - i. National Parks, Critical Wildlife Areas, Territorial Parks and other areas with legislated protection;
 - ii. Eskers;
 - iii. Wildlife calving and nursing areas;
 - iv. Denning sites;
 - v. Staging areas;
 - vi. Special locations such as salt licks, insect relief areas; and
 - vii. Areas used by females and their young.
- h) Discuss migration routes, water course crossings, travel corridors and areas important for Inuit harvesting within or in the vicinity of the RSA;
- i) Identify migratory routes, travel corridors, and water crossings which may interact with project infrastructure;
- j) Identify habitat within the LSA which are important for forage, shelter and reproduction of any rare or sensitive species, such as Species at Risk or those with similar designations or federal and territorial status;
- k) Provide available information from relevant scientific research and Inuit Qaujimaningit and Traditional Knowledge on the potential impacts of noise, vibration, dust and dust deposition on terrestrial wildlife VECs; and
- l) Discuss other pertinent issues identified through public consultation.

9.1.11.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities on the terrestrial environment. This analysis should:

- a) Determine potential impacts of all Project components and activities during all phases on terrestrial wildlife in the LSA:
 - i. Interference with migratory routes;
 - ii. Alienation from important habitat (e.g., denning sites, calving and post-calving areas);
 - iii. Habitat fragmentation; and
 - iv. Disturbance or disruption.
- b) Determine potential impacts on population size, abundance, distribution and behaviour of terrestrial wildlife VECs from:
 - i. Direct and indirect loss of habitat from the presence of and use of infrastructure, the conduct of project activities and associated sensory disturbances;
 - ii. Direct and indirect impacts from potentially degraded water quality and ground contamination as well as airborne contaminants resulting from Project facilities and associated activities;
 - iii. Direct and indirect impacts from climate change; and
 - iv. Alteration of normal behaviour or patterns and associated outcomes for overall energy balance for the relevant VEC (if any).
- c) Determine potential impacts on terrestrial wildlife from ground traffic and air traffic disturbance, particularly low level flights (i.e., lower than 610 metres) during critical periods (calving, post-calving, migration, denning, staging). Provide a delineated flight impact zone to determine the potential impact of flights on wildlife during critical life cycle periods;
- d) Determine potential impacts on terrestrial wildlife from injury or mortality caused by Project activities as well as intentional killing of wildlife to defend human life or property;
- e) Determine potential impacts on terrestrial wildlife from increased hunting pressure resulting from improved access due to Project infrastructure;
- f) Determine potential impacts of noise and vibration on wildlife due to any Project activities and components during all phases;
- g) Assess the potential for Project activities to act as an attractant to terrestrial wildlife species and discuss the associated effects/changes to behaviour and conditions;
- h) Evaluate the potential for contaminants to be released into the environment due to the Project and to be taken up by VEC species;
- i) Determine the potential impacts of contamination to sources of traditional food (including those trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes) as a result of bioaccumulation (i.e., food chain uptake through air, water and soil). Discuss all proposed monitoring methods that will be used to track these potential impacts;
- j) List all potential contaminants and determine whether possible uptake of these contaminants into country foods will result from the Project;
- k) Determine potential impacts from the loss or alteration of habitat due to all Project components and activities during all phases; and

- 1) Evaluate the relative health and potential for chemical toxicity for inherently sensitive wildlife species based on an analysis of exposure pathways and demographic parameters.

9.1.12 Birds and Bird Habitat

For the purpose of the current Guidelines, discussion relating to birds shall include raptors, migratory birds, marine birds and the associated habitat of each.

9.1.12.1 Baseline Information

- a) Provide an overview of bird species, population and distribution in the RSA. Focus on identified bird VECs and species with special designations (Species at Risk listed on Schedule 1 of the federal SARA and species with designations by the COSEWIC). Refer to species having significant ecological functions, and/or of importance to Inuit life and culture;
- b) Describe current habitat use by VECs, including the use of Migratory Bird Sanctuaries, Key Migratory Bird Sites, Territorial Parks and other important habitat (e.g., breeding, nesting sites, staging areas) in the RSA;
- c) Describe the relative seasonal/annual abundance, distribution and trends in range or habitat use, movement and population status of bird VECs. Discuss reproductive success, mortality rates, density, diversity; and
- d) Describe migratory patterns and routes of VECs potentially impacted by the Project and discuss corresponding sensitive periods.

9.1.12.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities during all phases on birds. This analysis should:

- a) Describe the potential loss, alteration or isolation of habitat (e.g., staging and nesting habitats) as a result of the Project development. Special consideration should be given to Species at Risk listed on Schedule 1 of the federal SARA, species with designations by the COSEWIC, species having significant ecological functions or of importance to Inuit life and culture;
- b) Discuss the potential interactions, accidental injuries and mortality of birds directly or indirectly due to the Project;
- c) Discuss the potential direct and indirect effects on bird behaviour, distribution, abundance, migration patterns, health and reproduction due to all Project components and activities during all phases;
- d) Describe potential disruption or alteration of migration routes due to Project activities and components during all phases;
- e) Account for alteration of normal behaviour or patterns and provide any associated outcomes for overall energy balance for the relevant VEC;
- f) Describe potential impacts of contaminant bioaccumulation via food chain uptake through air, water and soil, including specific impacts to traditional food sources. Discuss possible monitoring methods to track changes to this potential impact;

- g) Determine potential disturbances to birds from noise and vibration due to any Project components and activities during all phases;
- h) Determine potential impacts from pre-determined flight impact zones and potential for bird collision with aircraft;
- i) Determine potential for Project facilities to attract wildlife that may prey upon migratory birds and the resulting impacts on migratory bird populations;
- j) Determine the potential attraction of birds and other scavengers/predators to Project facilities and/or associated activities;
- k) Determine the potential attraction of birds to Project facilities and infrastructure as roosting and nesting sites; and
- l) Discuss the potential for spills, malfunctions and other accidents due to the Project and the corresponding impacts to birds.

9.2 Socio-Economic Environment and Impact Assessment

The Proponent shall present baseline information on the functioning and stability of the socio-economic environment in the RSA (see [Section 8.4](#)), with a corresponding impact assessment covering all Project phases of development [construction, operations, temporary closure, final closure (decommission and reclamation) and post-closure]. The Proponent shall also describe the components of the socio-economic environment and the processes affecting the components as they exist without the Project. This will serve as a baseline against which the potential changes and impacts of the Project can be measured and will also justify the Proponent's selection of VSECs and indicators.

The Proponent shall provide a clear rationale for its selection of communities, the public consultation carried out, and relevant reference studies and reports from which baseline data is collected. The Proponent shall describe the interactions between the socio-economic and biophysical environments, including the roles of the land and wage based economies and the nature of the mixed economy of the North. The Proponent should provide sufficient detail to demonstrate a proper understanding of the structure and functioning of the potentially affected communities that enables the Proponent to identify the potential of the Project to affect these communities, whether positively or negatively, and to ensure that any socio-economic mitigation measures put in place by the Proponent have a reasonable likelihood of attaining their objectives.

Whenever relevant and appropriate, data shall be disaggregated by age, gender, and ethnic affiliation. Socio-economic indicators should be used to present baseline information and subsequently measure impacts related to the Project. The EIS shall clearly identify and justify the indicators selected and the indicators chosen must be adequate to address all types of foreseeable impacts, including cumulative and residual impacts. In addition, the Proponent should include predictions regarding when potential impacts on each relevant VSEC could reasonably be expected. Finally, the Proponent is expected to clearly identify limitations and knowledge gaps encountered in its efforts to collect the required information.

Given the anticipated long-term operation of the Project, the Proponent shall indicate methods of updating baseline information to account for changes in the operating environment over time, and what criteria will be used to determine when baseline information requires updating.

9.2.1 Economic Development and Opportunities

9.2.1.1 Baseline Information

- a) Discuss the traditional economy and the current economic structure. Include discussion on:
 - i. The interaction between the wage and traditional economy;
 - ii. Development trends in the RSA; and
 - iii. Variability in potentially impacted communities as well as in Nunavut as a whole.
- b) Discuss the economic development levels in the RSA in comparison to other regions in Nunavut. Include discussion on the advantages and constraints of economic development in the RSA;
- c) Discuss the role the proposed Project development will play in economic terms and its significance for the local economy;
- d) Discuss the status of community and resident self-reliance; and
- e) Provide an overview of Nunavut's Real Gross Domestic Product, rate of Gross Domestic Product (GDP) growth, Consumer Price Index, import/export and trade balance of goods, personal savings rate and business investment.

9.2.1.2 Impact Assessment

- a) Determine potential impact on the local economy at the regional and community level as well as the implications of the Project on economic diversity;
- b) Determine potential impacts of the Project on traditional economic activities including hunting, fishing, tourism, and sport hunting/guiding;
- c) Determine potential impacts related to accessibility, removal/addition of barriers for traveling, fishing, hunting/trapping and other activities by local communities as a result of the Project; and
- d) Provide a discussion on the effects that the Project may have on Nunavut's Real Gross Domestic Product, rate of GDP growth, Consumer Price Index, import/export and trade balance of goods, personal savings rate and business investment.

9.2.2 Employment

9.2.2.1 Baseline Information

- a) Provide labour supply statistics in terms of relative gender, age and other demographic categories;
- b) Assess the current local and national labour force available to satisfy the needs of the Project development at each phase. Identify gaps between this availability and Project needs by education level or other categories that may help to identify barriers and needs

and include a discussion on the availability of Canadian labour and the potential need for foreign employees to address any gaps in meeting Project labour needs;

- c) Describe local household incomes, income sources and composition of income within the RSA;
- d) Provide sector specific breakdown of employment within the NSA;
- e) Identify existing local employment opportunities and labour supply status; and
- f) Discuss the requirements for employment (e.g. education levels, criminal records, drug and alcohol policies, language abilities) and the ability of meeting employment needs by local recruitment. Determine the extent to which the skills of available workers match job requirements.

9.2.2.2 Impact Assessment

- a) Assess the potential for development of the local labour force;
- b) Discuss culturally-sensitive workforce management practices that will meet both the Project's immediate labour needs as well as the region's longer-term economic development needs;
- c) Discuss potential changes in traditional activities and household function due to wage employment associated with the Project;
- d) Evaluate the possible effect of changes in income on savings, expenditure and consumption patterns, especially with changes to rental of public housing rental due to change in employment status;
- e) Evaluate the effects of competition for labour between the Project and other projects, existing businesses, institutions, and traditional activities; and
- f) Discuss potential impacts on employment due to temporary and final Project closure.

9.2.3 Education and Training

9.2.3.1 Baseline Information

- a) Provide an overview of the existing education system (early childhood through post-secondary);
- b) Discuss available training programs for adults and youth through the existing education system;
- c) Describe the local education infrastructure, capacity, funding resources, and administration system; and
- d) Discuss the education and skill levels of the residents in the RSA and the experience of the local labour force in different demographic categories based on available data.

9.2.3.2 Impact Assessment

- a) Assess Project impacts to the education system and how it would influence training programs. Include an evaluation on how the Project might affect attendance, retention of teachers, class sizes, and other components of the education system;
- b) Provide an assessment on the demands the Project might place on the educational infrastructure, capacity, funding resources and administration system;

- c) Determine the requirements for education levels, skills and experience of the labour force for the Project in the short, medium term and foreseeable future. Consider the expansion of the Project lifespan and regional economic development;
- d) Discuss the potential need of local labour force training to meet the needs of the Project. Identify the types of training that is specifically required by the Project as well as training geared toward universally applicable skills that improve workers' opportunities in other sectors of the local economy. Include predictions on training resources and resources required to deliver training programs, if applicable;
- e) Evaluate training programs planned by the Proponent. Discuss the associated challenges and likelihood of success of trainees to satisfy the Project needs and regional economic development with consideration of cultural and language barriers;
- f) Discuss the potential for longer term community capacity building programs;
- g) Discuss other possible solutions to fill the gaps between labour requirements of the Project and the education level and qualifications of the local labour force.

9.2.4 Contracting and Business Opportunities

9.2.4.1 Baseline Information

- a) Provide the most up-to-date statistics and data available as it relates to contracting and business opportunities from socio-economic studies of communities in the RSA;
- b) Provide an estimate of goods supplied to the Project, including country food for Inuit workers, procurement, service contracts and other business opportunities in the RSA that may result from the Project; and
- c) Discuss local and regional economic structure and characteristics, existing business types, scales of the different sectors of economy and existing capacity to meet the needs of the Project.

9.2.4.2 Impact Assessment

- a) Assess the economic effects (positive and negative) due to contracting and business opportunities through the lifespan of the Project;
- b) Identify opportunities for local, regional and territorial businesses to supply goods and services directly to the Project and to indirectly meet the demand created by the expenditure of new income by employment in the Project;
- c) Assess the effects of the Project in other local and regional economic sectors, in particular the competition to other business' needs due to limited supply capacity in the region;
- d) Assess Project contributions made to the public, communities and Inuit;
- e) Assess the potential of local and regional procurement to meet Project needs;
- f) Discuss barriers to building capacity in local businesses;
- g) Assess existing country food supply sources from the Project region and Nunavut and opportunities to supply country foods for Inuit workers at the Project;
- h) Assess opportunities for local communities to diversify their economic sources and to supply new goods and services to meet the need generated by the Project; and

- i) Determine potential impacts on local businesses and services due to temporary and final closure of the Project.

9.2.5 Population Demographics

9.2.5.1 Baseline Information

- a) Describe regional and local community populations, demographics and population trends; and
- b) Discuss observed variations in education levels, dietary habits, religions, ethnicities, and other social aspects in different demographic categories in the RSA.

9.2.5.2 Impact Assessment

- a) Discuss the potential for project-induced demographic changes in population, migration (including in-migration from outside of Nunavut), population re-distribution or movement of Nunavummiut between communities and the effects of those changes. Provide details on potential interactions between local residents and non-residents;
- b) Discuss potential effects of short-term Project employment on the local population; and
- c) Discuss potential effects from various Project phases, including unemployment as a result of temporary suspension of operations or closure.

9.2.6 Traditional Activity and Knowledge

For the purpose of the current Guidelines, traditional activity, and traditional knowledge shall consider land use, food security, language, cultural activities as well as subsistence and commercial harvesting.

9.2.6.1 Baseline Information

- a) Describe the cultural, ethnic, religious and language characteristics in the RSA;
- b) Describe the characteristics of the local and regional economy in relation to traditional land use activities and the wage income;
- c) Describe the significance, availability and level of dependence on traditional foods as a major nutritional source by local residents within the RSA. Provide details on:
 - i. Type of country foods consumed or expected to be consumed in the RSA; and
 - ii. Descriptions (including maps) of traditional and current hunting ranges and hunting patterns in the LSA.
- d) Provide details regarding wildlife and vegetative species that are culturally valuable to Nunavummiut.

9.2.6.2 Impact Assessment

- a) Discuss the potential effects of the Project on the accessibility of wildlife species to harvesters where such may be affected by reductions in habitat and population size and changes in migration patterns or human travel routes. Consider the risks to present and future generations of harvesters;

- b) Determine potential impacts related to accessibility to areas for hunting, fishing, marine harvesting, traveling, recreational and religious activities as a result of the Project. ;
- c) Discuss the potential effects on sustainable resource use (e.g., country food availability, accessibility of carving stone deposits) taking into account the cumulative effects assessment throughout the lifespan of the Project;
- d) Determine potential impacts to terrestrial and marine wildlife of cultural or practical importance to Nunavummiut;
- e) Determine potential impacts to the ongoing productivity of local or regional commercial, recreational or Aboriginal fisheries;
- f) Determine potential impacts to vegetation of cultural or practical value to Nunavummiut;
- g) Describe methodology for compliance with the *Official Languages Act*; and
- h) Determine potential impacts that the contamination of traditional food sources, including those trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes may have on individuals, families, communities and the ability of Inuit to engage in the traditional lifestyle.

9.2.7 Non-traditional Land and Resource Use

9.2.7.1 Baseline Information

- a) Describe known non-traditional land and resource use including protected areas, visual, and aesthetic resources;
- b) Provide an overview of local and regional land use activities in the LSA;
- c) Describe current and traditional land use areas and the importance of those areas to Inuit culture and social wellbeing;
- d) Describe known land use activities and their relation to the local economy, self-reliance, food supply and livelihood;
- e) Describe identified and anticipated overlapping zones and/or areas where other land use activities co-exist or interact with Project components and activities during all phases; and
- f) Describe current tourism activities and recreational use occurring in the Project LSA and RSA.

9.2.7.2 Impact Assessment

- a) Describe the impacts to known non-traditional land and resource use including protected areas, visual and aesthetic resources;
- b) Discuss anticipated interactions between Project development and land use activities by local residents in the RSA; and
- c) Describe the potential impact on the tourism industry due to the development of the Project which may impair the wilderness experience in the RSA.

9.2.8 Heritage Resources

The Proponent should secure the services of an authorized archaeologist to gather data on heritage resources. A list of consultant archaeologists is available at the Government of Nunavut's Territorial Archaeologist Office. The list of known archaeological sites within the Local Study Area (LSA) can be obtained by an authorized archaeologist through the submission of a formal Site Data Request form. The form can be obtained at the Government of Nunavut's Territorial Archaeologist Office.

9.2.8.1 Baseline Information

An authorized archaeologist should:

- a) Provide a summary description of known archaeological/paleontological, burial, cultural and historic, sacred and spiritual sites within the LSA based on Inuit Qaujimaningit and Traditional Knowledge and scientific baseline studies. Describe each site on a map that complies with relevant data licensing agreements. Send large-scale maps to the Government of Nunavut, Department of Culture and Heritage upon request to assist in its review;
- b) Describe regulatory requirements and procedures for the recovery and removal of artifacts and/or fossils in the proposed Project area; and
- c) Describe the relationship between the cultural sites and the social lives of local communities in the LSA.

9.2.8.2 Impact Assessment

An authorized archaeologist should:

- a) Determine the potential impacts to archaeological and paleontological resources (e.g., burial sites, sacred sites) and other cultural sites within the LSA resulting from development of Project infrastructure;
- b) Determine the potential impacts on archaeological and paleontological resources due to all Project components and activities during all phases. Discuss how potential impacts have been addressed/mitigated through infrastructure design (e.g., road alignment); and
- c) Determine the potential impacts on cultural wellbeing, religious and spiritual activities which are related to the cultural and historical, sacred and spiritual sites in the LSA.

9.2.9 Health and Wellbeing

For the purpose of the current Guidelines, discussions related to individual and community wellness shall include family and community cohesion as well as other indicators as may be selected by the Proponent.

9.2.9.1 Baseline Information

- a) Describe the current status of individual and family wellbeing. Include a discussion on household dynamics, family and community stability. Provide information on the capacity, availability and affordability, of local services and infrastructure in the communities (i.e., housing, training, education, day care services, health care);

- b) Describe household social structures within the RSA, and where possible, include:
 - i. Prevalent family composition (family/kin-relations co-existing, generations in the household);
 - ii. Gender roles;
 - iii. Prevalent division of household labour;
 - iv. Dominant consumption patterns;
 - v. Access to credit;
 - vi. Description on how resources are shared/divided within the household; and
 - vii. Household decision-making methods.
- c) Describe the current status of human health in the RSA. Discuss mental and physical health, wellbeing, previous history and exposure and identify vulnerable sub-groups where applicable; and
- d) Describe nutritional requirements of residents in the RSA along with quantitative information on the dietary habits of residents. Provide details such as the seasonal, gender and age-related consumption of country foods;
- e) Describe current substance abuse issues including trends relating to the importation of drugs and alcohol, crime and violence and other relevant social factors;
- f) Provide an overview of the current financial management programs available in the potentially affected communities; and
- g) Describe local and regional community and cultural values and initiatives that promote and support family and community health and cohesion.

9.2.9.2 Impact Assessment

- a) Determine potential impacts to individual and family well-being due to the Project;
- b) Determine potential impacts to household social structure due to the Project;
- c) Discuss the potential effects on lifestyle. Consider the effects of employment away from the home community;
- d) Discuss the potential effects on community and family stability and cultural integrity due to potential demographic changes;
- e) Discuss increased pressure on existing existing social, institutional and community services and facilities as a result of the Project;
- f) Discuss the potential effects on individual, family and community health and wellbeing due to workplace and community cross-cultural tension, conflict, and/or racism;
- g) Determine potential impacts on mental and physical health and wellbeing within the RSA resulting from potential indirect effects of the Project. Consider the impacts of gambling, substance abuse, family violence, sexually transmitted infections and other communicable diseases;
- h) Determine potential impacts on individual, family and community wellbeing as a result of increased access to alcohol and other controlled substances due to increased incomes as well as the potential movement of these substances through the Project site or via Project-related activities;

- i) Determine potential impacts to community safety and security. Include a discussion on potential increases in the frequency and types of crimes due to an influx of Project personnel into local communities during the life of the Project;
- j) Identify and discuss potential impacts of the Project on accident rates, alcohol/prohibited substance consumption and import/export;
- k) Describe barriers to current financial management programs and discuss any financial management incentives that would be provided by the Proponent to employees;
- l) Determine potential impacts on human health associated with the traditional lifestyle where large amounts of country foods are consumed. Consider the impacts of bioaccumulation associated with changes to the level of contaminant loadings in country foods (i.e., terrestrial and marine wildlife, fish, birds, and vegetation); and
- m) Determine potential impacts (directly or indirectly) to community wellbeing in the RSA due to the Project.

9.2.10 Community Infrastructure and Public Services

9.2.10.1 Baseline Information

- a) Describe existing community, cultural, and recreation programs;
- b) Describe existing transportation modes and travel routes/roads;
- c) Discuss costs to build infrastructure, transportation costs, and status of public services;
- d) Describe existing communication systems, services, and utilities;
- e) Describe community and regional waste management systems;
- f) Describe current conditions of local supply and demand of housing. Provide details on private, public and rental housing and their costs as well as supporting infrastructure and related capacity within the RSA;
- g) Describe existing public services and associated community facilities in the RSA (e.g., law enforcement, health care, emergency response, dependency assistance, welfare utilities, temporary accommodation, food services); and
- h) Describe existing outpost camps and other facilities outside of municipal boundaries which facilitate harvesting and recreation activities in the LSA.

9.2.10.2 Impact Assessment

- a) Identify and discuss the demand for community infrastructure and public services from the Project (directly and indirectly);
- b) Assess the effects on services and/or infrastructure (including housing) in public and private sectors due to the Project (directly or indirectly). Discuss Project-induced demographic changes and where the assessment determines an impact, outline proposed mitigation measures.
- c) Assess potential increased demand on the local and regional health care systems (i.e., standard medical system, emergency response emergency medical care, medevac services) and discuss the challenges raised by this demand increase;
- d) Discuss potential impacts on the availability and adequacy of existing health infrastructure and services including medical, dental, vision, social, mental (including

- addictions), environmental health officers, social workers, registered nurses, medical officers; access to medical travel and interventions;
- e) Discuss the construction of new structures and updates to existing structures beyond the boundary of communities and along hunting/travel routes and/or at hunting grounds which may facilitate local hunting activities/travel in Project areas;
 - f) Assess the incremental costs imposed by the needs of the Project (directly or indirectly) on public infrastructure and services. Consider also costs due to Project-induced demographic changes; and
 - g) Discuss community access to Project infrastructure.

9.2.11 Human Health and Safety

9.2.11.1 Baseline Information

- a) Describe human exposure to current environmental contaminants in the RSA; and
- b) Discuss local health statistics in comparison with other parts of Nunavut and Canada.

9.2.11.2 Impact Assessment

- a) Discuss the standards, guidelines and regulations that the Project will incorporate in all components and activities during all phase to minimize the impacts to and protect workers' health;
- b) Assess the health, safety and security of workers at the job sites taking into account different Project phases, locations and activities;
- c) Determine potential impacts on human health due to air and water contamination, exposure to high noise levels and extreme weather conditions during all Project activities and phases;
- d) Discuss the potential sources and characteristics of any conventional risks to workers or the public during all phases of the Project; and
- e) Discuss the impacts to human safety that may be brought about by changes in water flows and levels during all Project activities and phases, throughout the life of the Project.

9.3 Human Health and Environmental Risk Assessment

The Human Health Risk Assessment is to include:

- Predicted sources, quantities and points of release from the project emissions and effluents containing hazardous substances;
- Selection process for hazardous substance constituents of potential concern (COPCs);
- Identification of pathways to human receptors;
- Identification and characterization of human receptors (workers and the public), including maps to delineate their locations and the distances of communities, residences, temporary/seasonal residences, etc. to project sites and related infrastructure;

- Method used to convert hazardous substance exposure and intake by the various human receptors from the various pathways into an exposure or dose (e.g., conversion factors); and
- Criteria used to determine significance of impact (e.g., exposure relative to lifetime cancer risk limit).

The Environmental Risk Assessment is to include:

- Predicted sources, quantities and points of release from the project emissions and effluents containing hazardous substances;
- Selection process for COPCs;
- Identification of pathways to terrestrial and aquatic ecological receptors (VECs);
- Identification and characterization of terrestrial and aquatic ecological receptors;
- Method used to convert hazardous substance exposure and intake by the various ecological receptors from the various pathways into an exposure or dose (e.g., conversion factors); and
- Criteria used to determine significance of impact (e.g., toxicity reference values,).

The Proponent shall include a summary of proposed mitigation measures to prevent or reduce adverse health effects and environmental risks from the project.

9.4 Accident and Malfunctions Assessment

The assessment of accident and malfunction scenarios that have a reasonable probability of occurring must be provided, and should include the following:

- A description of the source, quantity, mechanism, rate, form and characteristics of contaminants and other materials (physical and chemical) likely to be released to the surrounding environment during the postulated accidents and malfunctions;
- The environmental effects and/or consequences that may result from such accidents and malfunctions; and
- A description of how each potential accident and malfunction would be managed and mitigated, including a description of any contingency, clean-up or restoration work in the surrounding environment that would be required during, or immediately following the incident.

The assessment for conventional accidents and malfunctions should include fire and explosion incidents and demonstrate that the most probable accident and malfunction scenarios are unlikely to cause long-term or residual effects both to persons and the environment, taking into account proposed mitigation measures, such as preventive measures and emergency response capability.

10.0 ENVIRONMENTAL MANAGEMENT SYSTEM

10.1 Environmental Management Plan

An Environmental Management Plan (EMP) provides a systematic approach to consistently managing all environmental affairs for the Proponent, addressing concerns through the allocation of resources, assignment of responsibility and ongoing evaluation of practices, with an aim to improving environmental performance through continual improvement of the management system. The EIS should include the Proponent's environmental policy, EMP, operational plans, and associated environmental management system for the Project. The EMP shall address how the Proponent proposes to manage potentially adverse environmental effects throughout the life of the Project.

The Proponent shall discuss the flexibility of the proposed EMP to respond to changes in the road and/or port development plan, the regulatory regime, the biophysical and socio-economic environments, technology, research results, and on-going understanding of Inuit Qaujimaningit, Inuit Qaujimajatuqangit, traditional knowledge, and community knowledge. The EIS should include discussion of how the results from the EMP will be used to support adaptive environmental management throughout all phases of the Project, and identify threshold/criteria and indicators to trigger management actions in each sub plan.

The EMP shall be comprised of individual monitoring and mitigation plans, specific to various aspects, components, activities and phases of the Project. Although the information requirements of the following sections are intended to be as comprehensive as possible, it is recognized that various items depend on the Proponent's development plans for the Project, which will continue to be refined throughout the Review. While some information required under these plans might not be available for the Proponent's initial EIS submission, the Proponent shall include a scheduled timeline relating to stages of the NIRB's review process or the later licensing/regulatory processes when this information will become available (i.e., Technical Meeting, *Final* EIS, Final Hearing, and Water Licensing). In addition, the NIRB recognizes that flexibility in the arrangement of the information requested in the following sections may be required and the Proponent may use its judgement in consolidating or arranging the information in the most effective fashion.

In its individual monitoring and mitigation plans, the Proponent shall also assess the likely effectiveness of mitigation measures and associated follow-up mechanisms for adaptive management. The Proponent shall provide a risk assessment of those economic (e.g., the global economy and international markets), or other conditions (e.g., ownership transfer) that might also impair the implementation or effectiveness of proposed mitigation measures or management.

10.2 Environmental Protection Plan

The Proponent shall, based on its impact predictions for identified VECs and VSECs, prepare an Environmental Protection Plan (EPP) in accordance with its EMP prior to commencement of all phases of the Project (site preparation, construction, operation, maintenance, any potential modifications, temporary closure, final closure (decommission and reclamation) and post-closure). The EPP shall be integrated into procedure documents for all phases of the Project that

target the site management staff, the Proponent's occupational health, safety and environmental compliance staff, as well as government departments and agencies tasked with environmental and regulatory compliance monitoring/surveillance. If appropriate, a table of contents and an annotated outline for the EPP should be presented in the EIS which addresses the major project activities, permit requirements, mitigation measures and contingency planning in combination with other management plans.

10.3 Monitoring and Mitigation Plans

In accordance with the EMP, the Proponent shall present individual monitoring and mitigation plans, specific to various aspects of the Project and the environment, and to be incorporated into all applicable phases of the Project. In these plans, the Proponent is required to outline how results from monitoring will be used to refine or modify the design and implementation of mitigation measures and management plans.

In the EIS, the Proponent should demonstrate how these plans will ensure that:

- The Project is conducted as proposed;
- The predicted adverse environmental effects are promptly mitigated at the earliest possible time;
- The regulatory requirements applicable to the Project will be met; and
- The works, equipment, and facilities connected to the Project are operating properly.

In its monitoring and mitigation plans, the Proponent should specify proposed criteria or thresholds to trigger mitigation measures if monitoring results warrant. These plans should also identify the position of the person responsible for the implementation of mitigation measures, the system of accountability and the phase and component of the Project to which the mitigation measure applies.

Each of the monitoring and mitigation plans shall include:

- Objectives of the monitoring program, and identifying any applicable laws, regulations and/or Acts;
- The VCs to be monitored, with associated parameters and indicators, and selection criteria/thresholds to be compliant with;
- Monitoring of the performance of waste management facilities (e.g., tailings), including physical, geochemical and geotechnical parameters/characteristics;
- Description of the frequency, duration, and geographic extent of monitoring with justification for each, and identification of the personnel who will conduct the monitoring, collect, analyze and interpret data;
- Description of measures taken to protect the monitoring infrastructure from climate change and potential major climate events (e.g., extreme flows);
- Proposed actions in the event that observed results (impacts) differ from those predicted, including a discussion of actions to be taken for observed non-compliance with the law or

regulations, performance targets or with the obligations imposed on contractors by the environmental provisions of their contracts;

- Proposed reporting scheme for monitoring results, including format, reporting intervals, and responsible territorial and federal authorities;
- Evaluation of the efficiency of mitigation measures, and the compliance with Project authorizations;
- Plans for integration of monitoring results with other aspects of the Project, including adjustments for operating procedures and refinement of mitigation measures;
- Procedures/mechanism to assess the effectiveness of monitoring programs, mitigation measures, and adaptive programs for areas disturbed by the Project;
- Discussion of the relationship between monitoring plans and the EMP; and
- Quality assurance and quality control measures to be applied to monitoring programs.

As described in [Section 8.4](#), the Proponent should consider the design of all biophysical environmental monitoring programs to ensure that the baseline data required is useful in understanding the relationship between the natural ecological conditions and the potential Project impacts on these conditions.

In addition, all monitoring plans should be designed so that results from these programs can be coordinated with ongoing regional initiatives or programs with relevant government organizations, or regional authorities.

10.4 Biophysical Environmental Plans

The Proponent shall present environmental monitoring and management plans developed to eliminate or mitigate potential negative impacts of the Project on the biophysical environment (see [Section 9.1](#) for a discussion on the biophysical environment). The Proponent shall also identify any residual effects after appropriate mitigation measures have been implemented. The plans should be developed to reflect the complete life span of the Project, and contain appropriate monitoring and evaluation techniques (e.g., indicators) that will allow regulators to intervene in a timely and constructive manner.

As the Project is anticipated to have an indefinite period of operation, the Proponent shall indicate how its environmental monitoring and management plans are anticipated to be updated to reflect current operating environments in the future. The plans should also contemplate changes that may be required in order to accommodate the use of the road, port and other infrastructure by reasonably anticipated potential projects such as mineral development of known deposits, and resupply transport to and from the coast to the south, including destinations within the Northwest Territories.

10.4.1 Risk Management and Emergency Response Plan

The Proponent shall provide an assessment of the potential risks from natural hazards in both aquatic and terrestrial environments. This plan shall encompass the whole life of the Project and

will provide mitigation measures which address the potential ecological and human health risks. The Proponent shall also identify and describe the likelihood of possible malfunctions and accidents that can occur during all phases of the Project, including those associated with natural hazards.

The Proponent shall develop an Emergency Response Plan supported by appropriate emergency response capabilities to deal with all emergency situations considered reasonable under the circumstances of the Project.

The Risk Management and Emergency Response Plan shall:

- a) Assess potential natural hazards in the LSA. Provide information on the frequency, magnitude and probability of occurrence. Consider natural hazards in the assessment (i.e., extreme weather events, natural seismic events, landslides and flooding);
- b) Analyze the potential for malfunctions and accidents associated with Project facilities and activities (land and/or ice based, air or marine transportation) occurring independent of or associated with natural hazards;
- c) Provide annual aviation audits for the aircraft types, companies and infrastructure associated with all Project-related air transportation and documentation of the minimum flying height and seasonal flight restrictions for the Project area;
- d) Assess the risk of fire and evaluate potential fire hazards. Provide details on fire protection systems and features that will be put in place to mitigate and/or prevent fires;
- e) Provide details on notification and reporting procedures and the associated responsible organizations and personnel;
- f) Provide details on contingency response procedures corresponding to each identified risk and discuss the associated security systems and prevention measures (e.g., monitoring, hazard and leak detection, fire control, and standby emergency systems);
- g) Discuss procedures for the medical transport of injured staff or persons within and beyond the Project area;
- h) Discuss the constraints resulting from logistics and timeframes for prompt action. Consider the potential distance to an accident or emergency site and possible weather conditions which might cause considerable delays or obstacles. Discuss measures that will be put in place to manage these constraints;
- i) Describe the roles of relevant government agencies, Inuit organizations and local communities in the development and application of the plans (if applicable); and
- j) Discuss any other measures that will be put in place to prevent loss or manage risk.

10.4.2 Fuel Management Plan

The Proponent shall develop a Fuel Management Plan based on its environmental policy, to promote environmental awareness and safety. This Plan is to be linked to Spill Contingency Plans and must:

- a) Identify the requirements of federal and territorial regulations;
- b) Provide conceptual design drawings for fuel storage areas and procedures for bulk fuel transfer;

- c) Identify substances covered by the plan (e.g. oil, fuel, hazardous materials, chemicals and other deleterious substances);
- d) Provide details on training provided and/or required for emergency response staff;
- e) Describe notification and reporting procedures; and
- f) Outline the duties and responsibilities of key organizations and personnel.

10.4.3 Spill Contingency Plan

The Proponent shall develop a Spill Contingency Plan based on its Environmental Policy which promotes environmental awareness and safety, and the efficient clean-up of potential spill incidents related to the Project. In the Plan, the Proponent shall address potential constraints to timely actions and immediate clean-up of spills which result from logistical and/or weather conditions and provide measures to managing these constraints. The Proponent shall include the following information in its Spill Contingency Plan:

- a) Identify the requirements of federal and territorial regulations;
- b) Provide the name, address and job title of the owner or person in charge, management or control;
- c) Provide the name, job title and 24-hour telephone number for the persons responsible for activating the spill contingency plan;
- d) Provide a description of all facilities including location, size and storage capacity;
- e) Describe the type and amount of contaminants normally stored at each facility (e.g., oil, fuel, hazardous materials, chemicals and other deleterious substances);
- f) Provide a site map of all facilities;
- g) Describe all steps to be taken to report, contain, clean up, and dispose of contaminants in the case of a spill;
- h) Describe the means by which the spill contingency plan is activated;
- i) Provide a description of the training provided to employees to respond to a spill;
- j) Provide an inventory and the location of response and clean-up equipment available to implement the spill contingency plan. Provide detailed information on clean-up strategies, technologies and corresponding inventory based on different substances and the environmental conditions where spills might occur;
- k) Provide the preparation date of the spill contingency plan;
- l) Discuss all potential spill scenarios (on land, water, and ice);
- m) Provide an outline of the duties and responsibilities of key spill response organizations and personnel; and
- n) Provide details on spill site restoration and remediation (e.g., treatment of contaminated soils).

10.4.4 Water Management Plan

The Proponent shall develop a Water Management Plan for the Project. This plan shall provide a consolidated source of information on the strategies to be applied to intercept, collect, contain,

conserve, monitor and prevent the release of potentially contaminated waters. The plan shall at a minimum:

- a) Identify flow paths of runoff from all Project components and activities with a probability to introduce contamination into water bodies;
- b) Describe water management strategies, including water conservation and recycling methods to maximize water reuse;
- c) Describe contingency plans should the required water volumes be significantly larger than estimated and describe measures for periods of low water availability;
- d) Discuss management measures to reduce potential adverse impacts on the aquatic environment due to the Project;
- e) Develop management procedures for all water in the Project area and discuss how the design of Project components and activities incorporates consideration of climate change, especially when water diversions are proposed (i.e., increased or decreased flows); and
- f) Develop conceptual operation and maintenance plans and include options for all water-utilizing Project components and activities.

10.4.5 Waste Management Plan

The Waste Management Plan should:

- a) Discuss wastewater treatment technologies and provide the estimated volumes and treatment targets of the effluent. Provide information on wastewater effluent discharge standards;
- b) Discuss wastewater management strategies during all phases of the Project (i.e., volumes, characteristics, treatment/disposal methods and associated facilities);
- c) Discuss contingency measures for wastewater treatment plant malfunctions and/or disturbances, associated spill response measures as well as treatment technologies and facilities;
- d) Develop a solid waste (domestic waste, construction waste, etc.) management plan for all phases and activities of the Project;
- e) Discuss waste management measures during periods of rainwater, snow, and spring freshet;
- f) Develop a solid waste site closure and reclamation plan;
- g) Develop measures/plans to reduce/reuse/recycle Project wastes; and
- h) Discuss and provide details of any planned use of municipal waste management facilities or service for the management of Project-generated waste (solid waste and wastewater).

10.4.6 Hazardous Material Management Plan

The Proponent shall develop a Hazardous Material Management Plan. Hazardous material encompasses, but is not limited to: hydrocarbon-contaminated soils, snow and water, fuel, lubricants, chemical reagents, solvents and paints, medical waste, and batteries. This plan shall be developed in connection with the Emergency Response and Contingency Plan and should:

- a) Characterize potential environmental hazards posed by hazardous material. Discuss hazardous material management procedures;
- b) Provide information on fuel storage monitoring;
- c) Describe safe handling and storage procedures for hazardous material;
- d) Discuss the allocation of responsibilities for managing and tracking shipments, storage, handling and use of potentially hazardous materials;
- e) Provide hazardous material contingency and emergency response plans;
- f) Identify the type and delivery of training for management, workers and contractors whose responsibilities include handling potentially hazardous materials as well as those that may be required to assist and/or treat any of the above if there is an emergency/accident (i.e., GN-CGS - Protection Services, local fire department, health centre, Royal Canadian Mounted Police detachment);
- g) Discuss procedures for the maintenance and review of records of hazardous material consumption and incidents in order to anticipate and avoid impacts on human health and the environment;
- h) Provide management plans for unused hazardous material upon the completion of specific Project activities or phases; and
- i) Discuss procedures to track and manage wastes generated through the use of hazardous material (e.g., provide information of shipments of potentially hazardous waste to licensed disposal facilities).

10.4.7 Road Management Plan

The Proponent shall develop a Road Management Plan for all access roads/trails proposed for the Project. The Plan shall address construction, operations, temporary closure and final closure phases of the Project. In association with the Spill Contingency Plan and the Wildlife Mitigation and Monitoring Plan, this plan shall:

- a) Provide information on the permitting regime and land tenure of all ground transportation as well as designations of accessibility to public;
- b) Discuss how the selected route(s) may correspond to the needs of other developers and of Nunavummiut. Focus on results of any public consultation undertaken with respect to the proposed routing, specifically as it may relate to traditional land or resource use;
- c) Provide information on public use of roads and control of public access;
- d) Provide construction details applicable to Transport Canada's Navigable Waters Protection Program which could include, but not be limited to, any works built or placed in, on, over, under, through or across a navigable waterway (i.e., bridges, booms, dams, and causeways);
- e) Provide projected traffic volumes. Include information on the types and numbers of vehicles to be used, fluctuations on a seasonal or annual basis and measures to enforce speed limits;
- f) Outline protocols for accidents, vehicle malfunction and emergency protocols;
- g) Discuss mitigation measures and protocols to be implemented during all phases of the Project to mitigate potential impacts to wildlife. Provide information on explicit

thresholds for mitigation of potential wildlife interactions, collisions and follow-up procedures;

- h) Discuss measures to prevent permafrost degradation due to Project activities and components during all phases;
- i) Describe operational procedures for daily operation and maintenance (i.e., dust suppression methods, snow removal, de-icing, snow drift/banks management);
- j) Describe measures to control surface runoff during spring freshet and flooding during all Project phases;
- k) Describe measures to control erosion during all Project phases and activities;
- l) Discuss safety procedures, emergency reporting, procedures for fuel/chemical spills, and other emergency events;
- m) Provide plans for site reclamation for all Project components during all phases (i.e., temporary construction camp, quarry sites, waste disposal) and discuss options of final closure and reclamation; and
- n) Discuss potential future uses for Project access roads/tracks (e.g., potential public use) as well as any other infrastructure, upon closure.

10.4.8 Port Management Plan

The Proponent shall develop a Port Management Plan for the proposed Grays Bay Port and associated facilities. The Plan shall address construction, operations, temporary closure and final closure phases of the Project. In association with the Spill Contingency Plan and the Wildlife Mitigation and Monitoring Plan, this plan shall:

- a) Provide information on the permitting regime and tenure of all infrastructure (marine or land-based) for the proposed Port facility;
- b) Discuss how Port may correspond to the needs of other developers, transportation projects, and of Nunavummiut and other Canadians;
- c) Describe protocols for use of the Port facilities by the public and safety and security measures required;
- d) Provide construction details applicable to Transport Canada's *Navigation Protection Act*;
- e) Provide details pertaining to the disposal of material due to maintenance dredging;
- f) Provide projected traffic volumes. Include information on the types and numbers of ships anticipated to use the facility, navigational requirements, and anchorages;
- g) Describe methods to be employed for ice management during the shipping season, including ice-breaking;
- h) Outline protocols for accidents, vehicle and ship malfunction, and emergency protocols;
- i) Discuss mitigation measures and protocols to be implemented during all phases of the Project to mitigate potential impacts to wildlife. Provide information on explicit thresholds for mitigation of potential wildlife interactions, collisions and follow-up procedures;
- j) Discuss measures to prevent permafrost degradation due to Project activities and components during all phases;

- k) Describe operational procedures for daily operation and maintenance (i.e., dust suppression methods, snow removal, de-icing, snow drift/banks management);
- l) Describe measures to control surface runoff during spring freshet and flooding during all Project phases;
- m) Describe measures to control erosion during all Project phases and activities;
- n) Discuss safety procedures, emergency reporting, procedures for fuel/chemical spills, and other emergency events;
- o) Provide plans for site reclamation for all Project components during all phases (i.e., temporary construction camp, quarry sites, waste disposal) and discuss options of final closure and reclamation; and
- p) Discuss potential future uses for Project access port/roads/tracks (e.g., potential public use) as well as any other infrastructure, upon closure.

10.4.9 Borrow Pits and Quarry Management Plan

The Proponent shall develop a Borrow Pits and Quarry Management Plan which should:

- a) Provide information on regulations and guidelines to be complied with;
- b) Describe measures to minimize the overall impact on surrounding environments by maximizing the use of existing pits and quarry sites to minimize the number of quarries, to minimize haul distances and reduce surface disturbance;
- c) Describe measures for sediment, dust and erosion prevention and control;
- d) Provide results of ARD/ML potential testing for quarried materials and pit walls and discuss associated mitigation measures;
- e) Discuss aggregate extraction and quarry methods. Provide associated mitigation measures for potential impacts on the environment;
- f) Propose methods for ice handling. Provide plans for the management of water released by the thawing of permafrost and ground ice; and
- g) Describe progressive reclamation strategies and discuss associated technologies.

10.4.10 Explosives Management Plan

The Proponent shall develop an Explosives Management Plan which provides information on explosives transport, storage and handling at the Project. This plan must:

- a) Provide information on applicable federal and territorial Regulations and Acts;
- b) Describe methods and procedures for the manufacture, transport, storage, handling, and use of explosives;
- c) Provide details on the manufacture and storage facilities for Ammonium Nitrate and Fuel Oil (ANFO), including applicable guidelines, monitoring protocols and reporting/action procedures;
- d) Discuss best practices to minimize usage and loss rate, including predicted loss rates and nitrogen loadings to the receiving environment;
- e) Describe safe handling and spill containment prevention methods;

- f) Evaluate all worst case scenarios (e.g., accidental explosion);
- g) Discuss security measures to be implemented;
- h) Describe personnel training program; and
- i) Provide details on internal audit programs and inspections.

10.4.11 Air Quality Monitoring and Management Plan

The Proponent shall develop an Air Quality Monitoring and Management Plan in association with the baseline data collected and the impact assessment in [Section 9.1.1](#). This plan must:

- a) Describe the proposed air quality monitoring and related adaptive management measures for emissions related to the Project as described in [Section 9.1.1.2](#), including ship-generated emissions. Provide information on thresholds for action and mitigation strategies;
- b) Discuss the emissions reduction strategy for the Project, through which the Proponent would employ appropriate technologies and operating practices in an effort to minimize emissions of air contaminants from all Project facilities. Provide information on compliance with approved criteria and methods to reduce the production of GHGs and other emissions;
- c) Provide a dust reduction plan which addresses the use of dust suppression agents, procedures and applicable guidelines for all Project areas where dust emission is a concern for air quality and human health; and
- d) Outline procedures for the reporting of project emissions and the results of monitoring programs.

10.4.12 Noise and Vibration Abatement Plan

The Proponent shall develop a Noise and Vibration Abatement Plan to provide information on the monitoring and mitigation of noise and vibration based on its impact assessment in [Section 9.1.3](#). This plan must:

- a) Provide applicable standards, guidelines and regulations that will be incorporated to minimize and mitigate noise and vibration effects due to the Project, including noise and vibration generated from marine shipping and transport activities;
- b) Describe the noise and vibration follow-up monitoring program indicating location, duration, timing and type of noise and vibration monitoring to be conducted;
- c) Describe noise and vibration control methods based on the climatic conditions and available technologies to be employed should mitigation be required;
- d) Provide measures and technologies to be adopted in the design and manufacture of Project infrastructure and facilities to reduce noise and vibration;
- e) Describe measures to minimize and attenuate noise and vibration (i.e., use of appropriate equipment, installation of noise and vibration management devices, schedule of take-off and landing aircrafts, blasting schedule); and
- f) Describe the occupational health management programs related to noise and vibration.

10.4.13 Aquatic Effects Management Plan

The Proponent shall develop an Aquatic Effects Management Plan to provide information on the proposed mitigation measures designed to protect and minimize the impacts on the aquatic system (freshwater and marine) from all project activities occurring in or near watercourses through all project phases as well as those plans and programs designed to monitor potential effects to the aquatic system. This plan must:

- a) Provide information on all applicable standards, guidelines and regulations;
- b) Describe erosion and sediment control measures for works in or near waterbodies and watercourses, including port facilities;
- c) Discuss measures to be applied to protect fish, aquatic biota and habitat during all activities and phases in or near freshwater and marine environments, including marine shipping and transport;
- d) Outline the monitoring and reporting protocols for effects to the aquatic environment;
- e) Describe the design of the monitoring study and field methodology. Provide information on indicators to be measured, sampling frequency and methods, timing, spatial extent and Universal Transverse Mercator (UTM) coordinates for each aquatic sampling location;
- f) Discuss the suitability of indicators, sampling design, methodology and analysis used to detect spatial and temporal project-related impacts on the aquatic ecosystem. Describe methods to demonstrate the validity of impact predictions presented in the EIS

10.4.14 Wildlife Mitigation and Monitoring Plan

The Proponent shall develop a Wildlife Mitigation and Monitoring Plan in consultation with Government of Nunavut-Department of Environment (GN-DOE), Fisheries and Oceans Canada (DFO), Environment and Climate Change Canada (ECCC) and other relevant agencies or organizations. This plan must include appropriate mitigation and monitoring for selected terrestrial and aquatic species with consideration for potential impacts identified in the relevant sections of the EIS. This plan shall:

- a) Describe wildlife mitigation and monitoring programs in the LSA and RSA;
- b) Provide selection criteria and rationale for all wildlife species selected for monitoring and mitigation programs;
- c) Describe methods of Inuit Qaujimaningit and Traditional Knowledge collection and the way in which Inuit Qaujimaningit and Traditional Knowledge has been integrated into baseline data collection, impact predictions and significance determinations as well as into the development of mitigation and monitoring programs;
- d) Provide details of plans for the involvement of local hunters in wildlife baseline studies and monitoring programs (if applicable). Discuss the mechanisms and resources allocated for local participation in monitoring programs;
- e) Describe plans for the coordination of wildlife studies/monitoring activities with other organizations, institutions, government departments and/or individual researchers conducting wildlife studies in the RSA to minimize the impacts on wildlife due to studies/survey activities;

- f) Discuss procedures to conduct terrestrial and marine wildlife surveys especially low elevation surveys and monitoring protocols (including data confidentiality) that will limit potential impacts on terrestrial and marine wildlife;
- g) Describe the design of monitoring programs and field methods. Provide information on indicators to be measured, sampling frequency and methods, timing, spatial extent and Universal Transverse Mercator (UTM) coordinates of transect lines (if applicable) for each wildlife species to be monitored;
- h) Describe the appropriateness and adequacy of indicators, sampling design, methodology and analysis to detect spatial and temporal project-related impacts on wildlife. Describe methods to demonstrate the validity of impact predictions presented in the EIS;
- i) Discuss measures to be applied to avoid or reduce disturbance, harassment, injury or mortality of terrestrial and aquatic wildlife due to the Project;
- j) Describe plans and mitigation measures to reduce potential impacts to terrestrial and aquatic wildlife and their habitat due to all Project activities and components during all phases;
- k) Describe data analysis methods and triggers/thresholds for adaptive management plans;
- l) Discuss the methodology for the evaluation of the effectiveness of mitigation measures;
- m) Discuss quality assurance and quality control measures; and
- n) Describe reporting and plan update procedures.

10.4.15 No Net Loss Plan

[Editorial Note: When the updated Fisheries Act comes into force it is anticipated that the Policy for the management of Fish Habitat (DFO 1986) will also be updated. DFO's No Net Loss policy is also expected to change. The Proponent is advised to contact the DFO assessor for this Project when preparing the EIS to ensure that the most up to date policy is followed.]

The Proponent shall present a No Net Loss Plan to discuss measures to be implemented to offset the loss of aquatic habitat due to Project activities and components. This plan should include the principle of No Net Loss for fish habitat as outlined in the Policy for the Management of Fish Habitat ([DFO, 1986](#)) and shall include, where appropriate, habitat replacement options, monitoring programs and offset plans developed in consultation with DFO and QIA. The No Net Loss Plan shall:

- a) Provide requirements related to DFO policies;
- b) Provide estimates of total fish habitat loss and methods used for estimations;
- c) Discuss plans to offset losses to fish habitat in order to achieve “No Net Loss” of fish habitat productive capacity;
- d) Describe procedures and structures designed to mitigate/manage potential impacts to fish and fish habitat during all phases of the Project including fish-out programs of any drained waterbodies or sections thereof, and of construction of multi-span bridges or other significant watercourse crossings.;
- e) Provide details on proposed offsetting options. Include information on locations and conceptual designs for implementation (e.g., rearing habitat, migration channels, etc.);

- f) Include a discussion on how Inuit Qaujimaningit and Traditional Knowledge was incorporated into the development of the No Net Loss Plan;
- g) Describe measures to be taken to mitigate any potential adverse effect on the fish habitat that could result from implementation of the No Net Loss Plan;
- h) Describe methodology to monitor plan implementation;
- i) Describe measures to be taken to verify the extent to which the Plan's objectives have been achieved;
- j) Describe the timeline and schedule for the implementation of the Plan; and
- k) Provide information on the consultation efforts for the No Net Loss Plan. Discuss the details of these consultation sessions.

10.5 Socio-Economic Environmental Plans

The Proponent shall present plans, policies and programs to minimize potential negative socio-economic effects and to optimize the potential positive effects of the Project on the socio-economic environment (see [Section 9.2](#) for a discussion on the socio-economic environment). These plans should be developed to reflect the complete life span of the Project, and contain appropriate monitoring and evaluation techniques (e.g., indicators) that will allow regulators to intervene in a timely and constructive manner.

The Proponent shall describe its socio-economic monitoring plans and mitigation programs, including how they will identify, manage and mitigate potentially adverse socio-economic impacts and augment positive socio-economic impacts. In consultation with the applicable Regional Socio-Economic Monitoring Committee (SEMC), the Proponent should clearly identify the role it will take in regional monitoring initiatives, including how its monitoring plans will align with those of the Regional SEMC.

In general, it is expected that the Proponent's socio-economic monitoring plans and programs will include human resources, occupational health and safety, community and public involvement, implementation of Inuit impact benefits agreements (IIBA), and if applicable, development partnership agreements. The Proponent shall outline how the predominant language/dialect in the RSA will be incorporated into each respective plan.

As the Project is anticipated to have an indefinite period of operation, the Proponent shall indicate how its plans are anticipated to be updated to reflect current operating environments in the future. The plans should also contemplate changes that may be required in order to accommodate the changes in the use of the road, port, and other infrastructure by future developments.

10.5.1 Business Development Plan

The Proponent shall provide a Business Development Plan that:

- a) Provides a list of commitments (e.g., workforce percentage) and discuss strategies for local/regional preferential hiring and contracting;
- b) Discusses strategies to build capacity for local businesses and entrepreneurs;

- c) Describes communication methods to share information on opportunities with local or regional businesses;
- d) Discusses community-based investment or initiatives that may lead to economic diversity; and
- e) Discusses what efforts the Proponent will undertake to ensure project-specific benefits can remain in the Kitikmeot region and/or in Nunavut.

10.5.2 Occupational Health and Safety Plan

The Proponent shall prepare an Occupational Health and Safety Plan in conjunction with its Spill Contingency Plan, Risk Management Plan, Noise and Vibration Abatement Plan and any other relevant plans. The Occupational Health and Safety Plan shall:

- a) Provide an overview of the occupational health and safety program for the activities and works being proposed;
- b) Outline policies and guidelines regarding the Project's interaction with Nunavut's medical health system;
- c) Describe safety and management procedures related to hazardous chemical, physical, and biological agents and materials. Provide information on the manufacture, storage, use and disposal of all applicable materials;
- d) Adopt best safety practices and safety awareness programs;
- e) Provide an overview of workplace conditions such as accommodation, food/nutrition, health and safety, alcohol/drug/smoking policies and recreation;
- f) Describe employee involvement and related training programs to ensure awareness of employee responsibilities in environmental and health and safety management. Provide information on the roles of employees as it relates to safety orientation, hazard analysis, first-aid training, human-wildlife encounters, etc.;
- g) Describe risk and safety management details on the preparedness of safety equipment and devices;
- h) Describe procedures for emergency incidence reporting and actions to be taken following an incident (i.e., procedures for medical transport of injured staff or persons, transport out of the location of the incident, ambulance or medical transportation onsite, medevac to local health center, hospital, referral south);
- i) Provide details on workplace monitoring and control; and
- j) Outline first aid training and occupational medical surveillance programs.

10.5.3 Community Involvement Plan

The Proponent shall present a Community Involvement Plan which shall:

- a) Describe mechanisms to provide information to the public and potentially affected communities regarding regular updates of Project's progress, initiatives and future work plans (e.g., training opportunities, hiring information);
- b) Describe plans and procedures to communicate with the public and Project employees during any temporary closure or slowdown periods;

- c) Describe methods and procedures to establish effective two-way communications to collect and address public concerns;
- d) Describe methods to evaluate public engagement efforts to determine plan effectiveness;
- e) Discuss measures to assist communities to address potential social needs and problems related to the Project (i.e., provision of counselling services for employees and their families on substance abuse, work-related stress management, family support);
- f) Outline approach to promote the participation of Nunavummiut in Project employment;
- g) Discuss plans to promote local contracting opportunities and the purchase of local products (e.g., country foods);
- h) Demonstrate the way in which community input has influenced the design and implementation of monitoring plans and initiatives;
- i) Discuss communications procedures for the Proponent and members of affected communities to disseminate Project monitoring results and Project information on social, cultural and environmental conditions; and
- j) Discuss the procedures for community-based monitoring of social, cultural, and environmental conditions to determine if, when, and how the Project is contributing to the sustainable development of the community.

10.5.4 Cultural and Heritage Resources Protection Plan

The Proponent shall present a Cultural and Heritage Resources Protection Plan in consultation with the Government of Nunavut-Department of Culture and Heritage. This Plan shall:

- a) Outline applicable regulations and guidelines for the management of potential impacts to identified cultural and heritage resources;
- b) Present the results of archaeological investigations and studies;
- c) Provide an inventory of known archaeological resources in Project areas;
- d) Discuss the results of the Proponent's impact assessment and describe the method with which the results were considered and incorporated into the plan; and
- e) Describe general and site-specific measures for the protection of archaeological sites and the mitigation of potential adverse impacts.

10.5.5 Human Resources Plan

The Proponent shall develop a Human Resource Plan in consultation with relevant GN departments where applicable, which shall:

- a) Provide applicable human resources legislation, the Proponent's understanding of labour standards practices and discuss the methods with which the Proponent proposes to meet employment and compensation policies as well as compensation and benefit programs (e.g., health care plan, insurance, vacation/maternity leave);
- b) Outline recruitment strategies with communities. Include information such as updates on employment/training opportunities, hiring plans, time schedules;

- c) Outline strategies to reduce barriers to labour force entry and to improve employee retention;
- d) Provide plans for training programs designed to assist the local labour force with potential employment (e.g., partnerships with local schools and other educational institutions, on-the-job learning, apprenticeships);
- e) Develop an Education and Orientation Plan to assist employees to understand their responsibilities in environmental protection and health and safety management and to provide cultural and financial management training;
- f) Provide details on worker and pay schedules, health and safety programs, recruitment policies, gender equality, skills and entry requirements, training, career development and counselling programs available to employees;
- g) Demonstrate the adaptation of proposed work schedules to traditional activities;
- h) Develop policies for:
 - i. On-site public safety and wellbeing;
 - ii. Cross-cultural awareness;
 - iii. Firearms control;
 - iv. Sexual and gender harassment;
 - v. Alcohol and drug control measures and reporting of incidents involving drugs/alcohol;
 - vi. Smoking policies;
 - vii. Gambling activities; and
 - viii. Supply of country food to Inuit workers at the Project site.
- i) Provide details on any priorities for Inuit, northerners or other staffing measures targeting specific categories of individuals;
- j) Develop recognition and management plans on the rights and requirements of hunting activities and traveling through Project areas by residents from adjacent communities;
- k) Outline strategies to communicate relevant information of IIBA terms and conditions to employees;
- l) Develop policies and regulations on hunting and fishing by non-Inuit employees, while respecting the rights and requirements of Inuit employees to harvest and pursue traditional activities. Demonstrate that the policies or regulations were designed to manage potential impacts to fisheries or wildlife resources; and
- m) Develop policies or regulations on the prohibition of recreational hunting, fishing and other related activities by employees at specific locations and periods in the Project area.
- n) Discuss skill transferability training and employment counselling upon Project closure and/or during temporary closure.

10.6 Closure and Reclamation Plan

The Proponent shall develop a preliminary Closure and Reclamation Plan for the Project, which outlines how the various components set out in [Section 7.0](#) will be decommissioned, reclaimed and closed following Project facilities closure. This plan can be preliminary with key issues

addressed for the environmental assessment in the NIRB's Review, and greater detail expected in the Nunavut Water Board Type "A" Water Licence Application. At a minimum, the plan submitted within the EIS should include the following:

- Demonstration that environmental issues associated with the effective closure and reclamation of all Project components have been considered at the earliest possible stage in the Project development process, including influencing the Project design;
- Identifying the Proponent's goals for reclamation of lands potentially affected by the Project;
- Description of reclamation methods, time frames and schedules, including proposed progressive reclamation, research programs, and notice periods to employees and public;
- Description of temporary closure measures and a discussion of at what point a temporary closure should be considered permanent for the purposes of triggering the implementation of the Closure and Reclamation Plan;
- Discussion of research programs to address challenges to reclamation, given the local conditions;
- Considerations for the protection of public health and safety;
- Description of the estimated contaminant and other material (physical and chemical) levels in the environment as well as estimated doses to members of the public after closure and remediation;
- Description of closure and post-closure monitoring of environmental components including, but not limited to, wildlife, vegetation, air quality, landform stability and water quality;
- Discussion about the long-term monitoring and maintenance that may be required once physical and chemical stability of reclaimed areas has been established;
- Discussion of how environmental effects will be reduced or eliminated once the Project ceases operation;
- Discussion regarding re-establishing conditions that will permit the land to return to a similar pre-Project land use;
- Identifying how the Proponent's plans reflect considerations associated with potential acid rock drainage and/or metal leaching potential of rocks, in association with related waste rock and waste management strategies; and
- Any considerations for the restoration the natural aesthetics of the project.

This plan is to be considered a "living" document; with the level of detail to be revised to reflect the progress of the Project as well as changes in technology and/or standards or legislation. Future revisions should also consider input from consultations with communities and other stakeholders on methods to be used, and potential uses for project infrastructure, etc.

10.6.1 Care and Maintenance Plan

A preliminary Care and Maintenance Plan shall be developed for the Project in conjunction with the Closure and Reclamation Plan, which outlines how the various components set out in [Section 7.0](#) will be treated in the event of a temporary closure or unplanned closure of the Project. The plan can be preliminary with key issues addressed for the environmental assessment in the Review and should include a discussion of the items listed previously in [Section 10.6](#).

10.7 Follow-Up and Adaptive Management Plans

A follow-up plan is a formal, ongoing process to verify the accuracy of the environmental impact(s) predicted in the environmental assessment and permitting stage of the Project, and to determine the effectiveness of proposed mitigation measures. If the Proponent identifies unusual and unforeseen adverse environmental effects, an adjustment to the existing mitigation measures may be required and/or the development of an adaptive plan with new mitigation or compensation measures may be necessary. In order to minimize the likelihood of mitigation failures and to limit the potential severity of consequences if there is such a failure, the Proponent must discuss how information related to the effectiveness of mitigation measures will be analyzed, and how associated adaptive measures will be employed in the environmental management system to address any such failures. The EIS should include the following information about the Proponent's follow-up and adaptive management plans:

- The need for such a follow-up and adaptive plan and its objectives;
- How this plan will be structured, including enforcement and penalties for non-compliance;
- Which elements of the monitoring program described in [Section 10.3](#), would be incorporated;
- The mechanisms through which monitoring results will be analysed, and mitigation measures or adaptive plans will be adjusted if necessary;
- How the effectiveness of any new or adjusted mitigation measures will be assessed and verified;
- The roles to be played by the Proponent, regulatory agencies, and others in such a plan, and possible involvement of independent researchers;
- The sources of funding for the plan and reporting; and
- Identification of the quantitative triggers or thresholds that will indicate the need to alter or vary the management plan or mitigation measures.

10.8 Significance of Residual Impacts

The EIS shall include an assessment of the significance of residual effects of the Project on the components of the biophysical and human environments after the mitigation measures proposed by the Proponent have been implemented. This analysis of the potential residual effects on the VCs, should enable readers of the EIS to clearly understand the consequences of the Project, the

degree to which effects on the VCs can be mitigated with the mitigation measures proposed and identifying those effects which cannot be mitigated or compensated for.

The Proponent should include a summary table in this section of its EIS, which presents the effects before and after mitigation on the VCs, the mitigation measures applied and the residual effects have been assessed.

The determination of significance of residual impact shall take into account the attributes of each impact in accordance with the criteria established in [Section 8.6.6](#).

11.0 LIST OF CONSULTANTS AND ORGANIZATIONS

The Proponent shall prepare a list of all the consultants who contributed to the preparation of the EIS, including their professional credentials, role and contact information in an appendix to the EIS. In addition, the Proponent shall prepare a list of the organizations consulted, including the time, place, and purpose of the consultation; reference materials provided, and contact information for the organization.

12.0 CONCLUSION

The EIS should end with a conclusion presenting a summary analysis of the overall projected biophysical and socio-economic impacts, anticipated transboundary and cumulative effects, proposed mitigation measures, and residual impacts. While highlighting the impacts on the Kitikmeot region where the Project is being proposed, this conclusion should clearly present the importance of the EIS findings to the Nunavut Settlement Area specifically and Canada more generally.

LITERATURE CITED

- ACIA (Arctic Climate Impact Assessment). 2005. *Arctic Climate Impact Assessment*. Cambridge University Press, 1042p.
- CCDS (Canadian Climate Data Scenario). 2018. *Canadian Climate Data Scenario Website*: <http://climate-scenarios.canada.ca/?page=main>. Accessed January 2018.
- CEAA (Canadian Environmental Assessment Agency). 2003. *Incorporating Climate Change Considerations into Environmental Assessment: General Guidance for Practitioners*. Available at: <http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=A41F45C5-1&toc=hide>. Accessed January 2018.
- Duinker P. and L. Greig. 2006. “The Impotence of Cumulative Effects Assessment in Canada: Ailments and Ideas for Redeployment.” *Environmental Management*, 37(2), 153-161.
- Ellis, S.C. 2005. “Meaningful Consideration? A Review of Traditional Knowledge in Environmental Decision Making.” *Arctic* 58, 1: 66–77.
- Greig L., K. Pawley and P. Duinker. 2002. “Alternative scenarios for future development: an aid to cumulative effects assessment.” *Canadian Environmental Assessment Agency, Research and Development Monograph Series*. Hull, QC. Available at: http://www.ceaa.gc.ca/015/001/021/index_e.htm.
- Hansen, S., and J.W. VanFleet. 2003. *Traditional Knowledge & Intellectual Property: A Handbook on Issues and Options for Traditional Knowledge Holders in Protecting Their Intellectual Property and Maintaining Biological Diversity*. American Association for the Advance of Science. <http://shr.aas.org/tek/handbook>. Accessed January 2018.
- IPCC (Intergovernmental Panel on Climate Change). 2018. *Intergovernmental Panel on Climate Change Website*: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml. Accessed January 2018.
- NIRB (Nunavut Impact Review Board). 2006a. *Guide 6b: A Proponent’s Guide to Conducting Public Consultation for the NIRB Environmental Assessment Process*. Cambridge Bay, NU: NIRB.
- NIRB (Nunavut Impact Review Board). 2006b. *Guide 7: Guide to the Preparation of Environmental Impact Statements*. Cambridge Bay, NU: NIRB.
- NIRB (Nunavut Impact Review Board). 2007. *Guide 2: Guide to Terminology and Definitions*. Cambridge Bay, NU: NIRB.
- NIRB (Nunavut Impact Review Board). 2009. *Guidelines for the Preparation of an Environmental Impact Statement for Baffinland Iron Mines Corporation’s Mary River Project (NIRB File No. 08MN053)*. November 16, 2009. Cambridge Bay, NU: NIRB.
- NIRB (Nunavut Impact Review Board). 2011. *Guidelines for the Preparation of an Environmental Impact Statement for AREVA Resources Canada Inc.’s Kiggavik Project (NIRB File No.09MN003)*. May 2011. Cambridge Bay, NU: NIRB.
- PCO (Privy Council Office). 2003. *A Framework for the Application of Precaution in Science-based Decision making about Risk*. Privy Council Office.

- QIA (Qikiqtani Inuit Association). 2009. Letter to the NIRB Re: *Draft Guidelines for the Preparation of an Environmental Impact Statement – Baffinland Iron Mines Corporation, Mary River Project*. July 31, 2009.
- Thorpe, N.L., S. Eyegetok, N. Hakongak, and Qitirmiut Elders. 2001. *Tuktu and Nogak Project: A Caribou Chronicle. Final Report to the West Kitikmeot Slave/Study Society*. Ikaluktuuttiak, Nunavut.
- Tilleman W. 2005. *The Dictionary of Environmental Law and Science*. 2nd ed. Environmental Law Centre, AB: 437 pp.
- UN (United Nations). 1987. *Report of the World Commission on Environment and Development*. General Assembly Resolution 42/187, 11 December 1987. Retrieved April 12, 2007.
- UNCED (United Nations Conference on Environment and Development). 1992. *Agenda 21: United Nations Conference on Environment and Development, Rio*. June 1992. Rio de Janeiro, United Nations.
- Usher, P. 2000. “Traditional Ecological Knowledge in Environmental Assessment and Management.” *Arctic* 53, 2: 183–93.
- White, G. 2006. “Cultures in Collision: Traditional Knowledge and Euro-Canadian Governance Processes in Northern Land-Claim Boards.” *Arctic* 59, 4: 401–1.
- Wenzel, G.W. 1999. “Traditional Ecological Knowledge and Inuit: Reflections on TEK Research and Ethics.” *Arctic* 52, 2: 113–24.

APPENDIX A *DRAFT* SCOPE LIST FOR THE GRAYS BAY ROAD AND PORT PROJECT PROPOSAL

DRAFT

- Up to 230 drainage areas would be required: approximately 18 single or multi-span bridges, up to 50 culverts of diameters between 1.5 m and 5 m, in addition to numerous culverts less than 1.5 m in diameter.
- Up to four (4) temporary camps used during construction of the road, relocated every three (3) months as construction progresses, with each camp to accommodate up to 80 personnel per year. Additional camp infrastructure would include: offices, maintenance shops, equipment and material storage, fuel storage (up to 20,000 litres (L) diesel stored in enviro-tanks, in addition to limited amounts of propane and gasoline), water use, and temporary waste and wastewater storage facilities.
- Wastewater and sewage transported to Grays Bay Port or Jericho Station for treatment, incineration or backhaul and disposal at accredited facility until permanent solid waste and sewage facilities are commissioned.

ii) Grays Bay Port Facility

Activities and Facilities would include construction and operations of a Grays Bay Port, open annually during the open-water season (July to October), managed through port fees, specifically:

- Initial development of one (1) wharf, designed based on the potential docking size of a 75,000 deadweight tonnes Ore-Bulk-Oil class 1A vessel, and a second wharf when demand warrants.
- Dredging of sea floor to reach appropriate depths in the development of the wharf.
- Installation of a small craft harbour to provide safe moorage for up to 50 vessels, including floating docks, launching ramp, refueling station containing approximately 5,000 L of gasoline, tent and refuge area, light vehicle parking for the public, and optional breakwater to reduce wave height within the harbour.
- Installation of appropriate navigation aids.
- Transport, temporary storage, and staging of materials and equipment including:
 - Mobilization of construction materials and equipment via two (2) ocean freighters and barges, lightering and delivering to the Grays Bay shore, followed by annual sealift deliveries during construction and operations.
 - During construction, staging and laydown areas established to store and maintain equipment and supplies, provide loading and unloading facilities, stockpile granular material, store fuel, and provide helicopter landing sites.
 - During operations, laydown and container storage area would support the receipt, handling, and storage of any materials or supplies required for any exploration and mining projects as well as community resupply.
- Establishment of a camp and associated port facilities: temporary accommodations of up to 60 personnel during construction, and permanent, seasonal accommodations for up to 20 personnel per year during operations; offices and support buildings; maintenance shops; generators; water management and waste water treatment facilities; solid waste and wastewater storage facilities including landfill and incinerator; and helicopter pad.
- Establishment of fuel storage facilities within secondary containment to initially contain 25 million litres (ML) of diesel with the potential to expand to 100 ML of diesel.

- Establishment of an up to 1,800 m airstrip constructed initially at either the proposed location of the permanent strip or at a widened section of the embankment along Grays Bay Road at a suitable location. The permanent 1,800 m gravel airstrip and access road would be constructed and operated year round and involve support infrastructure including air traffic control, fuel storage facilities to hold up to 90,000 L of jet fuel, a shelter building, a cargo shelter, and maintenance garage for storage of snowplowing and airfield grading equipment.
- Progressive development of facilities for third party users, including accommodations, hotel, and commercial facilities which may require site grading.

iii) Jericho Station

Activities and Facilities would include the establishment of the Jericho Station located at or near the existing Jericho Mine Site for maintenance crew and truck drivers, including:

- Construction and operations of a vehicle parking area, three (3) person camp, offices, refuelling facilities, refuge station, and associated water, waste, and power facilities. Wastes backhauled to accredited facility or disposed of at Jericho station if incinerator or permanent waste storage location established.
- Optional use of the existing airstrip associated with the Jericho Mine during construction to mobilize the workforce and to bring in supplies. During operations, potential use of the existing airstrip at Jericho for emergency response.
- Up to 5,000 L fuel stored at the airstrip in drums or enviro-tanks.
- Tank farm established within secondary containment to hold up to 20 ML of fuel.
- Staging areas constructed to store materials in transit from Grays Bay until winter road established.

iv) Winter Road

Activities and Facilities would include the construction and operation of a winter road to connect various sites including:

- During construction, winter road sections would be constructed to access quarries and mobile camps along the all-weather road route.
- During pre-construction and annually thereafter, a winter road would connect the Jericho Station to Contwoyto Lake and the Tibbitt-Contwoyto Winter Road to transport supplies.
- During construction, approximately 1,000 trucks each winter season would transport supplies, with yearly amounts of traffic expected to decrease significantly during operations.

v) Quarrying

Activities and Facilities would include quarrying of up to 40 temporary and permanent sites to supply up to 8,000,000 cubic metres (m³) of rock for construction of the road and port, with up to 100,000 m³ required annually during operations for road maintenance. Locations approximately every seven (7) km and ideally within 500 metres of the proposed all-season road; every third quarry potentially a permanent quarry used for the life of the Project. Blasting may be required from some if not all quarries during construction; explosives would be stored in accordance with regulations.

vi) Water Use

Activities and facilities would include water use of up to 600 m³ per day (100,000 m³ per year) during construction, and less than 100 m³ per day during operations; sources yet to be determined.

SCOPE OF THE ASSESSMENT

1) Anticipated Effects of the Environment on the Project

The scope of the assessment will include the potential for the Arctic environment to exert effects on the Project throughout the Project's life, including the following specific factors:

- a. Climate and meteorology including climate change
- b. Permafrost
- c. Geotechnical hazards including slope movement, differential or thaw settlement, frost heave, and ice scour
- d. Subsidence
- e. Flooding
- f. Unfavorable geological conditions
- g. Sea level change

The scope of the assessment will include the potential for conditions in Nunavut's unique socio-economic environment, including the following specific factors:

- a. Limited availability of labour and capacity
- b. Limitations on physical infrastructure

2) Anticipated ecosystemic and socio-economic impacts of the Project

The assessment of the potential for ecosystemic and socio-economic impacts to result from the proposed project components and activities as outlined in the section above will be inclusive of the factors listed below. The assessment of impacts to each valued ecosystemic or socio-economic component shall take into account appropriate temporal and spatial boundaries and draw upon relevant information from scientific sources, Inuit Qaujimaningit¹, traditional and community knowledge.

- a. Air quality including greenhouse gases
- b. Climate and meteorology
- c. Noise and vibration
- d. Terrestrial environment, including:
 - i) Terrestrial ecology
 - ii) Landforms and soils
 - iii) Permafrost and ground stability
- e. Geological features including discussion of geology and geochemistry
- f. Hydrological features and surface water quality
- g. Hydrogeology and groundwater
- h. Sediment quality

¹ Inuit Qaujimaningit encompasses Inuit traditional knowledge (and variations thereof) as well as Inuit epistemology as it relates to Inuit Societal Values and Inuit Knowledge (both contemporary and traditional).

- i. Freshwater aquatic environment, including:
 - i) Aquatic ecology
 - ii) Aquatic biota including representative fish as defined in the *Fisheries Act*, aquatic macrophytes, benthic invertebrates and other aquatic organisms
 - iii) Habitat including fish habitat as defined in the *Fisheries Act*
 - iv) Commercial, recreational, and Aboriginal fisheries as defined in the *Fisheries Act*
- j. Terrestrial vegetation
- k. Terrestrial wildlife and wildlife habitat, including:
 - i) Representative terrestrial mammals to include caribou, caribou habitat, migration and behavior, muskoxen, wolverine, grizzly bears, Polar Bears, wolves and less conspicuous species that may be maximally exposed to contaminants, with specific consideration of effects on caribou of the Bathurst and Dolphin and Union herds
 - ii) Wildlife migration routes and crossings, with specific consideration of potential effects on migration of the Bathurst caribou herd
- l. Birds and bird habitat, including:
 - i) Raptors
 - ii) Migratory birds
 - iii) Seabirds
- m. Marine environment, including:
 - i) Marine ecology
 - ii) Marine water and sediment quality
 - iii) Marine biota including fish and benthic flora and fauna
 - iv) Marine habitat
 - v) Commercial, recreational, and Aboriginal fisheries as defined in the *Fisheries Act*
- n. Marine wildlife
- o. Terrestrial and marine Species at Risk, including
 - i) Species under consideration for listing on the *Species at Risk Act*
 - ii) Species designated “at risk” by the Committee on the Status of Endangered Wildlife in Canada
- p. Socio-economic factors, including:
 - i) Economic development opportunities
 - ii) Employment
 - iii) Education and training
 - iv) Contracting and business opportunities
 - v) Population demographics
 - vi) Benefits and revenues (tax, royalties, etc.)
- q. Traditional activity and knowledge and community knowledge including:
 - i) Land use
 - ii) Food security
 - iii) Language
 - iv) Cultural and commercial harvesting
- r. Non-traditional land use and resource use
- s. Heritage resources
 - i) Archaeology

- ii) Paleontology
 - iii) Cultural
- t. Health and well being
 - i) Individual and community wellness
 - ii) Family and community cohesion
- u. Community infrastructure and public services
- v. Health and safety including employee and public safety
- w. Cumulative effects, giving specific consideration to the project in terms of existing, proposed, and reasonably foreseeable future mining and transportation infrastructure projects, with specific consideration of advanced mineral projects such as Izok Lake, Ulu, High Lake, the Tibbetts-Contwoyto Winter Road, and an all-weather road from the Northwest Territories
- x. Residual effects
- y. Transboundary effects

3) *Measures proposed by the Proponent to avoid and mitigate adverse ecosystemic and socio-economic impacts, including contingency plans*

The scope of the assessment will include any contingency plans or risk management plans to avoid and mitigate adverse impacts caused by the proposed project components and activities. These plans must extend, where relevant, through all project phases. These plans shall take into account the appropriate temporal and spatial boundaries and are expected to draw upon relevant information from scientific sources, best practice as well as traditional and community knowledge and are to include, but not be limited to:

- a. Avoidance, Mitigation and Offsetting Measures specifically related to fisheries offsetting for the Grays Bay Road and Port Project
- b. Emergency response
- c. Spill response
- d. Hazardous materials management
- e. Accidents and malfunctions
- f. Regulatory requirements
- g. Monitoring and Adaptive Management
- h. Mitigation measures

4) *Steps which the Proponent proposes to take to optimize benefits of the Project, with specific consideration being given to expressed community and regional preferences as to benefits*

The scope of the assessment will include steps that the Proponent proposes to take to optimize benefits of the project, and should include, but not be limited to:

- a. Compensation and benefits
- b. Health benefits
- c. Human health and well-being
- d. Employment
- e. Education and training
- f. Land use

- g. Contracting and business opportunities, and
- h. Any non-confidential details from an Inuit Impact and Benefit Agreement.

5) *Measures proposed by the Proponent to compensate persons whose interests are adversely affected by the Project*

The scope of the assessment will include the steps that the Proponent proposes to take to compensate interests of parties adversely affected by the Project including all non-confidential details pertaining to any Inuit Impact and Benefit Agreement pursued in connection with the Project.

6) *Measures proposed by the Proponent to restore ecosystemic integrity after the permanent closure of the project*

The scope of the assessment will include any closure and reclamation plans to ensure that issues associated with the effective closure and reclamation of all Project components are considered at the earliest possible stage in the development process, thereby influencing design to take into account environmental issues related to closure and reclamation. These plans must extend, where relevant, through all project phases. These plans shall take into account the appropriate temporal and spatial boundaries and are expected to draw upon relevant information from scientific sources, best practice as well as traditional and community knowledge and are to include, but not be limited to:

- a. Care and Maintenance
- b. Closure and Reclamation

7) *Any monitoring programs that the Proponent proposes to establish and to manage the ecosystemic and socio-economic interests potentially affected by the Project*

The scope of the assessment will include any programs that would be established to monitor the potential ecosystemic and socio-economic impacts caused by the proposed project components and activities.

8) *The interests in lands, waters and other resources which the Proponent has acquired or seeks to acquire*

The scope of the assessment will include consideration for any interests in lands, waters and other resources which the Proponent has secured or seeks to secure based on the proposed works and activities or undertakings that constitute the Grays Bay Road and Port project proposal.

<i>Organization</i>	<i>Requirement</i>
Nunavut Impact Review Board	Project Certificate
Nunavut Water Board	Type 'A' Water Licence
Kitikmeot Inuit Association	Land Use Licences, leases, easements, right-of-ways, and Quarry Concession Permit(s)
Government of Nunavut – Department of Culture and Heritage	Archaeology Permit(s) and Palaeontology Permit(s)

<i>Organization</i>	<i>Requirement</i>
Government of Nunavut – Department of Environment	Wildlife Research Permit, Spill Contingency Plan approval
Nunavut Research Institute	Scientific Research Licence
Indigenous and Northern Affairs Canada	Class A Land Use Permit, Quarry Permits, and Land Use Lease(s)
Environment and Climate Change Canada	Approval for dredging, Environmental Emergency Plan approval
Fisheries and Oceans Canada	Section 35 authorization under the <i>Fisheries Act</i>
Natural Resources Canada	Licence for a Factory and Magazine
Transport Canada	Navigable Waters Approval(s) and/or Exemption(s) and Oil Pollution Prevention/Emergency Plan as per the <i>Canada Shipping Act</i> , Approval under the <i>Navigation Protection Act</i>
Workers Safety & Compensation Commission	Permit to Store Detonators, Explosives Use Permit

9) *Options for carrying out the Project that are technically and economically feasible and the anticipated ecosystemic and socio-economic impacts of those options*

The scope of the assessment will include consideration for alternative means of carrying out the Project that might be economically and technically feasible and the environmental effects of those alternative means. This assessment will include alternate timing and development options, as well as presenting the “no-go” or “no-build” alternative, and the “preferred” alternative. The “no-go” alternative is not only a potentially stand-alone option; it also serves as a baseline for comparison with other development alternatives that might reasonably be proposed in the circumstances.

10) *Any other relevant information or matters*

The scope of the assessment will include any other matters that the NIRB considers relevant, including:

- a. Technical innovations previously untested in the Arctic including new technology for port and road design and operations
- b. Inuit Qaujimaningit, traditional and community knowledge
- c. Statement of consultation principles and practices
- d. Significant effects analysis
- e. Sustainability analysis
- f. Interactions with Valued Ecosystem Components and Valued Socio-Economic Components
- g. Discussion of similar resource development projects in other jurisdictions
- h. Planned future development and the associated level of uncertainty