



**Revised *Draft* Guidelines for
the Preparation of an Environmental Impact
Statement
for
Agnico-Eagle Mines Ltd.'s
Meliadine Project (NIRB File No. 11MN034)**

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GLOSSARY

This glossary is provided for the Proponent's greater certainty; the onus is on the Proponent to request clarification from the NIRB on any term it feels has not been made clear. This glossary includes terminology and definitions that are specific to Nunavut and the proposed project. Additional glossary terms can be found in the NIRB's *Guide 2: Guide to Terminology and Definitions* ([NIRB, 2007](#)).

Please note that, where possible, a reference has been provided for each of the terms below.

<i>Commissioner's Lands</i>	Lands administered by a municipality in Nunavut, or by the Government of Nunavut.
<i>Cumulative impacts or effects</i>	The impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions (Tilleman, 2005). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
<i>Ecosystemic</i>	Relating to the complex of a natural community of living organisms and its environment functioning as an ecological unit in nature.
<i>Esker</i>	A long winding ridge of gravel, sand, etc. originally deposited by a melt water stream running under a glacier (INAC, 2007b).
<i>Fugitive dust</i>	Also referred to as fugitive mist or fugitive vapour. Dust, mist, or vapour containing a toxic pollutant, regulated under federal legislation that is emitted from any source other than through a stack (Tilleman, 2005).
<i>Harvest</i>	The reduction of wildlife into possession, and includes hunting, trapping, fishing, as defined in the <i>Fisheries Act</i> , netting, egging, picking, collecting, gathering, spearing, killing, capturing or taking by any means (GC and TFN, 1993).
<i>Ice scour</i>	Geological term for long, narrow ditches in a seabed, created by the collision of fast ice and pack ice and the grounding of icebergs.
<i>Inuit</i>	Aboriginal peoples of northern Canada and Greenland. In the context of Nunavut, for the purpose of these Guidelines, meaning those people to whom NLCA Beneficiary status is ascribed.
<i>Inuit Owned Lands</i>	Means (a) those lands that vest in the DIO [Designated Inuit Organization] as Inuit Owned Lands pursuant to Section 19.3.1 [of the NLCA], and (b) any lands that are vested in, acquired by or re-acquired by the DIO as Inuit Owned Lands from time to time pursuant to the [NLCA], so long as they maintain such status pursuant to the [NLCA] (GC and TFN, 1993).

<i>Inuit Qaujimajatuqangit</i>	Means the traditional, current and evolving body of Inuit values, beliefs, experience, perceptions and knowledge regarding the environment, including land, water, wildlife and people, to the extent that people are part of the environment (QIA, 2009). This definition replaces the definition in NIRB's <i>Guide 2: Guide to Terminology and Definitions</i> (NIRB, 2007)
<i>Inuit Qaujimaningit</i>	Encompasses Inuit Traditional Knowledge (and variations of Inuit Qaujimajatuqangit), as well as Inuit epistemology as it relates to: <ul style="list-style-type: none"> a) Inuit Societal Values (including the legal obligations set out in the NLCA regarding Inuit Participation, Inuit employment and training, etc. intended to assist Inuit socio-economic development); b) Inuit Knowledge (both contemporary and traditional) as it relates to environmental and ecological knowledge of a given area and based on the collective day-to-day use of Inuit hunters of that area of concern (QIA, 2009).
<i>Local Study Area</i>	That area where there exists the reasonable potential for immediate impacts due to project activities, ongoing normal activities, or to possible abnormal operating conditions.
<i>Nunavummiut</i>	Residents of Nunavut.
<i>Nunavut Land Claims Agreement (NLCA)</i>	The "Agreement Between the Inuit of the Settlement Area and her Majesty the Queen in Right of Canada", including its preamble and schedules, and any amendments to that agreement made pursuant to it (Tilleman, 2005).
<i>Potentially affected communities</i>	A community or communities with the potential to be impacted, either positively or negatively, by a proposed project or development. Such communities may be defined physical entities or comprised of dispersed populations in the area of influence of a development or project.
<i>Precautionary principle</i>	Where 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 (UN, 1972).
<i>Proponent</i>	The organization, company, or department planning to undertake a proposal (Tilleman, 2005).
<i>Reasonably foreseeable future development</i>	Projects or activities that are currently under regulatory review or that will be submitted for regulatory review in the near future, as determined by the existence of a proposed project description, letter of intent, or any regulatory application filed with an authorizing agency (NIRB, 2007).
<i>Regional Study Area</i>	The area within which there is the potential for indirect or

	cumulative biophysical and socio-economic effects.
<i>Residual Impacts</i>	Those predicted adverse impacts that remain after mitigating measures have been applied (Tilleman, 2005).
<i>Rock glacier</i>	Boulders and fine material cemented by ice about a meter below the surface.
<i>Rock heave</i>	The movement of rock as a result of freezing and thawing.
<i>Sacred site</i>	A place on the land created or used by Inuit spiritual leaders in the past for religious ceremonies, such as: a platform or formation leading to an “altar”; a hill, mountain, stone, boulder, river, lake, or Inukshuk designated as a sacred site; an offering place where people might plead for good fortune and well-being, often found along the coast, but also inland; a place where an unusual event might have happened, or an event that led to a death or a story of survival; a place known to Elders in legend where a significant story occurred (Ittarnisilirijiit Katimajiit, 1996).
<i>Scoping</i>	A process that pinpoints significant issues requiring study and analysis. This process aims to identify those components of the biophysical and/or socio-economic environment that may be impacted by the project and for which there is public concern (NIRB, 2008).
<i>Tailings</i>	Residue of raw material or waste separated out during the processing of crops or mineral ores. Those portions of washed or milled ore that are regarded as too poor to be treated further (Tilleman, 2005).
<i>Talik</i>	Permanently unfrozen ground in regions of permafrost. Usually applies to a layer that lies above the permafrost but below the active layer, often occurs below waterbodies.
<i>Thermal stability</i>	The degree to which something, such as permafrost, has the capacity to remain at the same temperature over time.
<i>Transboundary impacts</i>	Any impact, not exclusively of a global nature, within an area under the jurisdiction of a Party caused by a proposed activity, the physical origin of which is situated wholly or in part within the area under the jurisdiction of another Party (UN, 1991).
<i>Valued Ecosystem Components (VECs)</i>	Those aspects of the environment considered to be of vital importance to a particular region or community, including: <ul style="list-style-type: none"> a) resources that are either legally, politically, publically, or professionally recognized as important, such as parks, land selections, and historical sites; b) resources that have ecological importance; and c) resources that have social importance (NIRB, 2007).

*Valued Socio-Economic
Components (VSECs)*

Those aspects of the socio-economic environment considered to be of vital importance to a particular region or community, including components relating to the local economy, health, demographics, traditional way of life, cultural well-being, social life, archaeological resources, existing services and infrastructure, and community and local government organizations ([NIRB, 2007](#)).

LIST OF ACRONYMS

AANDC	Aboriginal Affairs and Northern Development Canada
ANFO	Ammonium Nitrate and Fuel Oil
ARD	Acid Rock Drainage
ATV	All-Terrain Vehicles
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
EC	Environment Canada
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
GHG	Greenhouse Gas
GN	Government of Nunavut
HTO	Hunters' and Trappers' Organization
IIBA	Inuit Impact and Benefit Agreement
INAC	Indian and Northern Affairs Canada
IOL	Inuit Owned Land
IPG	Institution of Public Government
IR	Information Request
KIA	Kivalliq Inuit Association
LSA	Local Study Area
MB	Megabyte
ML	Metal Leaching
MSDS	Material Safety Data Sheets
NGMP	Nunavut General Monitoring Program
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claims Agreement
NNLP	No Net Loss Plan
NPC	Nunavut Planning Commission
NSA	Nunavut Settlement Area
NWB	Nunavut Water Board
NWMB	Nunavut Wildlife Management Board
OHF	Oil Handling Facility
PAG	Potential Acid Generation
PM	Particulate Matter

PM ₁₀	Particulate matter of 10 micrometres or less
PM _{2.5}	Particulate matter of 2.5 micrometres or less
PMP	Probable Maximum Precipitation
QIA	Qikiqtani Inuit Association
RSA	Regional Study Area
SARA	Species at Risk Act
SEMC	Socio-Economic Monitoring Committee
SOPEP	Shipboard Oil Pollution Emergency Plan
TDS	Total Dissolved Solids
TK	Traditional Knowledge
TSP	Total Suspended Particulate
VEC	Valued Ecosystem Component
VSEC	Valued Socio-Economic Component

PART I – THE ASSESSMENT

1.0 INTRODUCTION

1.1 OBJECTIVE OF NIRB GUIDELINES

Pursuant to Section 12.5.2 of the *Nunavut Land Claims Agreement* (NLCA):

“When a project proposal has been referred to NIRB by the Minister for review, NIRB shall, upon soliciting any advice it considers appropriate, issue guidelines to the Proponent for the preparation of an impact statement. It is the responsibility of the Proponent to prepare an impact statement in accordance with any guidelines issued by NIRB...” ([GC and TFN, 1993](#))

The present Guidelines are issued for the preparation of an Environmental Impact Statement (EIS) for the Meliadine project (the Project) as proposed by Agnico-Eagle Mines Ltd. (AEM or the Proponent). An EIS is a documented evaluation of the project proposal, providing detailed information regarding the proposal’s environmental and socio-economic impacts ([NIRB, 2006b](#)). It includes the identification and development of mitigation measures or actions taken to lessen the actual or foreseen adverse environmental impact of a project or activity ([Gregorich et al., 2001](#)). The EIS also contains monitoring and reporting methods to verify the accuracy of the Proponent’s impact predictions.

1.2 EIS GUIDELINE DEVELOPMENT

The Meliadine project is subject to the environmental review and related licensing and permitting processes established by the NLCA ([GC and TFN, 1993](#)). In correspondence dated September 14, 2011 the Minister of Aboriginal Affairs and Northern Development (the Minister) referred the Meliadine project to the Nunavut Impact Review Board (NIRB or Board) for public Review pursuant to Part 5 of Article 12 of the NLCA.

The Minister also responded to the following issues of concern identified in the NIRB’s Screening Decision Report for this file:

1. *Agnico-Eagle Mines Ltd.’s (AEM) “All-Weather Road Project”* – the Minister indicated that, should AEM choose to reapply for early development of an all-weather road to the Meliadine site, it would be essential that the mine proposal (i.e. project description) be updated to reflect the modified proposal. The Minister further noted that the discretion to consider and subsequently grant exceptions under NLCA 12.10.2 rests with the Board and should only be exercised after careful consideration.
2. *Potential Cumulative Effects of Increasing Mineral Development in the Kivalliq Region* – The Minister agreed that the cumulative ecosystemic and socio-economic effects resulting from the increasing levels of mineral development in the Kivalliq Region warranted special consideration, and further observed that in assessing cumulative impacts on caribou, it would be essential that the scope of the Board’s review include consideration of transboundary effects.

3. *Level of Information Currently Available in Support of the Project Proposal* – The Minister emphasized his support for ensuring that sufficient information was in place prior to commencing key stages in the review process.
4. *Availability of Participant Funding* – The Minister stated that, while funding has been provided for a limited number of complex projects in Nunavut on a case by case basis in the past, AANDC did not have an established participant funding program in place. As such, the Minister was not in a position to provide participant funding for the review at that time.

The NIRB has developed these EIS Guidelines based on the information contained within the Revised *Meliadine Project Proposal* submitted by the Proponent ([AEM, 2011](#)) and on the NIRB's public scoping process. The Guidelines establish the nature and scope of the issues that the Proponent must address in the EIS.

1.3 PREPARATION AND REVIEW OF THE EIS

Upon receipt of the NIRB's EIS Guidelines, the Proponent is required to prepare and submit to the NIRB an EIS that meets or exceeds the requirements specified herein. While the Guidelines are intended to facilitate the Proponent's creation of an EIS submission, 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 increased certainty on expectations by all parties. Although the information requirements of the EIS Guidelines are intended to be as comprehensive as possible, it is recognized that some of the information requested herein may not be available for the initial EIS submission to the NIRB. When this judgement is made by the Proponent in 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. Therefore, the NIRB will consider the initial EIS submission to be a draft document as the level of information requested or available may evolve throughout the review process and/or may be deemed more pertinent for a *Final* EIS submission.

It is also 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.

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. In particular, omissions in these Guidelines 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 environmental or socio-economic effects.

The NIRB will conduct a conformity review of the material presented in the Proponent's submission of an EIS to determine whether the document conforms to these Guidelines. The guideline conformity review is focused on identifying whether any information requested in the Guidelines or in the NIRB's Minimum EIS Requirements ([Appendix A](#)) has been

omitted from the EIS. Guideline conformity review is a presence or absence analysis rather than an evaluation of the quality of the information presented, although the NIRB may point out significant deficiencies encountered. Should any omissions be identified, the Proponent is responsible for submitting supplementary information and may be required to revise and resubmit the EIS.

Following a positive EIS Guideline conformity determination by the NIRB and acceptance of the EIS submission, the NIRB will distribute the EIS to Inuit organizations, community stakeholders, Federal and Territorial regulatory agencies, technical advisors, and other interested parties for review. The technical review period involves a more detailed review of the EIS than the guideline conformity review, and is intended to analyze the quality of the information presented by the Proponent. A technical review of an EIS comprises the following:

- Determination of whether Parties agree/disagree with the conclusions in the EIS regarding the alternatives assessment, environmental impacts, proposed mitigation, significance of impacts, and monitoring measures – and reasons to support the determination;
- Determination of whether or not conclusions in the EIS are supported by the analysis – and reasons to support the determination;
- Determination of whether appropriate methodology was utilised in the EIS to develop conclusions – and reasons to support the determination, along with any proposed alternative methodologies which may be more appropriate (if applicable);
- Assessment of the quality and presentation of the information in the EIS; and
- Any comments regarding additional information which would be useful in assessing impacts – and reasons to support any comments made.

1.4 REASSESSMENT OF THE GUIDELINES

The NIRB reserves the right at any time, having given reasonable notice to the Proponent, to reassess these Guidelines and to update and amend them accordingly to allow for consideration to changes in the Project description, baseline information, relevant technological advances, or changes in the regulatory and/or regional environments.

2.0 GUIDING PRINCIPLES

2.1 THE NIRB'S IMPACT REVIEW PRINCIPLES

In accordance with the NIRB's primary objectives found in the NLCA, Section 12.2.5, the following principles should be followed in the review process, and precautionary approaches should be adopted in the preparation of the EIS:

- **An ecosystem-based approach must be adopted for the review** - In order to gain an adequate understanding of the effects of the Project, an ecosystem-based approach must be adopted 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, such as the Project's potential to affect economic development within the region, must be included in the review** - Members of the community constitute a critical part of the environment, and their concerns relating to the Project need to be assessed by the NIRB. As such, adverse and beneficial effects of the Project on members of the community with respect to health, recreation, and other aspects of social well-being need to be addressed in the EIS, in order to ensure a culturally holistic understanding of the Project's effects.
- **An understanding of past and potential future environmental, economic, and social trends in the region potentially affected by the proposed, and how the Project will influence these trends is required** - The inclusion of a time perspective on all phases of the Project, from the early planning stages through operations and closure including post-closure and maintenance phases where appropriate. It is important to include all phases of the Project in order to provide the NIRB with a full understanding of the cumulative environmental effects in combination with other past, present and reasonably foreseeable projects.
- **The well-being of residents of Canada outside the Nunavut Settlement Area must be taken into account** – Significant transboundary biophysical and socio-economic effects directly related to this Project must be included in the EIS in order to ensure the NIRB's assessment of the well-being of Canadians outside of the NSA.

The NIRB will consider the need for, alternatives to, and alternative means of carrying out the Project in assessing the justifiability of any significant environmental and socio-economic effects identified, and in formulating its recommendations to the responsible Minister.

2.2 PUBLIC PARTICIPATION AND ENGAGEMENT

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, Aboriginal groups, and other governments or other organizations, including where relevant, adjacent jurisdictions outside of the NSA. 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 traditional knowledge (TK);
- Identifying VECs and VSECs;
- Evaluating the significance of potential impacts;
- Deciding upon mitigating measures; and
- Identifying and implementing monitoring measures, including post-project audits.

Another objective of the NIRB review process is to involve potentially affected Nunavummiut to address concerns regarding any changes that the Project may cause in the environment and the resulting effects of any such changes on the traditional and contemporary use of land/ice and resources. The Proponent must ensure that Nunavummiut have the information that they require in respect to the Project and on how the Project may impact them.

Meaningful involvement in the environmental impact assessment process takes place when all parties involved have a clear understanding of the proposed project as early as possible. The NIRB Review process requires the development of a public participation and an awareness program to initiate engagement of the public during the initial stages of the review, and to facilitate meaningful consultation with those communities potentially affected by a proposed project.

The Proponent must provide the highlights of any public engagement within the EIS, including the methods used, the results, and the ways in which the Proponent intends to address the concerns identified.

2.3 TRADITIONAL KNOWLEDGE

A growing number of researchers are calling on government regulatory agencies to integrate local or traditional knowledge with “scientific” knowledge in a number of resource areas ([Davis and Wagner, 2003](#)). As noted by [Berkes et al., \(2000\)](#), this is partly due to a recognition that such knowledge can contribute to the conservation of biodiversity ([Gadgil et al., 1993](#)), rare species ([Colding, 1998](#)), protected areas ([Johannes, 1998](#)), ecological processes ([Alcorn, 1989](#)), and to sustainable resource use in general ([Schmink et al., 1992](#); [Berkes, 1999](#)). The incorporation of traditional knowledge into regulatory frameworks may also reflect a widespread concern regarding the social and economic sustainability of natural resource based livelihoods throughout the world ([Blaikie and Brookfield, 1987](#); [McGoodwin, 1990](#); [Meadows et al., 1992](#); [WCED, 1987](#)).

The term Inuit Qaujimajatuqangit refers to Inuit “Traditional Knowledge” (TK); while Inuit Qaujimaningit refers to Inuit TK as well as Inuit epistemology without reference to temporality ([QIA, 2009](#)). In this document, TK or Inuit TK broadly refers to Inuit Qaujimaningit and is meant to encompass local and community based knowledge, ecological knowledge (both traditional and contemporary), which is rooted in the daily life of Inuit people, and has an important contribution to make to an environmental assessment ([Stevenson, 1996](#)).

This knowledge represents experience acquired over thousands of years of direct human contact with the environment ([Berkes, 1993](#)) and is rooted in personal observation, collective experience and oral transmission over many generations. TK relates to factual information on such matters as ecosystem function, social and economic well-being, and explanations of these facts and causal relations among them. It plays a significant role in the EIS development in term of acquisition of adequate baseline information, identification of key issues, prediction of the effects, and assessment of their significance, all of which are essential to the EIS and its review. Recognizing TK as indispensable element both as baseline information and as an Inuit lens through which impact analyses can be better understood can also result in more active and meaningful community engagement.

TK can be obtained with the cooperation of other concerned parties. Peer-referenced, systematic identification of local TK experts assures that those considered most knowledgeable within either the local community, social group, or livelihood fraternity will be revealed and potentially included in work dedicated to documenting the local ecological knowledge system ([Davis and Wagner, 2003](#)). The Proponent must incorporate into the EIS the TK to which it has access or the TK that it may reasonably be expected to acquire through appropriate due diligence, in keeping with appropriate ethical standards and without breaching obligations of confidentiality.

2.4 PRECAUTIONARY PRINCIPLE

One of the purposes of environmental assessment is to ensure that projects are considered in a careful and precautionary manner before authorities take action in connection with them, in order to ensure that such 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](#)). This precautionary principle has since been incorporated into several pieces of Canadian legislation, including the *Canadian Environmental Protection Act* ([Government of Canada, 1999a](#)), the *Oceans Act* ([Government of Canada, 1996](#)), and the *Canada National Marine Areas Conservation Act* ([Government of Canada, 2002a](#)). In applying a precautionary approach to its planned undertakings, the Proponent must:

- Demonstrate that the proposed 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 proposed 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.

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 VECs 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 NLCA:

In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. NIRB shall take into account the well-being of residents of Canada outside the Nunavut Settlement Area.

The EIS Guidelines are based upon three 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” defined as: where 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](#)).

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 goals.

3.0 SCOPE OF THE NIRB ASSESSMENT

The scope of the NIRB's assessment for the project proposal is based on the requirements of Sections 12.5.2 (items a – j) and 12.5.5 (items a – h) of the NLCA as listed below, the NIRB's Minimum EIS Requirements ([Appendix A](#)), the project proposal submitted by the Proponent and any direction provided by the Minister to the NIRB as per Section 12.5.1 of the NLCA.

The NIRB has also conducted public scoping sessions in the following potentially affected communities in the Nunavut Settlement Area (NSA): Rankin Inlet, Chesterfield Inlet, Whale Cove, Arviat, Repulse Bay, Coral Harbour and Baker Lake. The objective of these meetings were to allow the NIRB to effectively engage the public and interested parties on the proposed scope of the assessment, while soliciting their advice on valued ecosystem components (VECs) and valued socio-economic components (VSECs) that should be addressed by the Proponent in

its EIS. A *Public Scoping Meeting Summary Report* will be developed following these community visits taking into account all comments received from community members and is expected to be released in January 2012. A copy of the *Final Scope of the NIRB's Assessment for the Meliadine project proposal* (December 15, 2011) can be found in Appendix B.

In preparing the EIS, the Proponent must follow these Guidelines closely, while paying specific attention to the requirements of the NLCA, the NIRB's Minimum EIS Requirements ([Appendix A](#)), and the General EIS Principles as described in the NIRB's *Guide 7: Guide to the Preparation of Environmental Impact Statements* ([NIRB, 2006b](#)).

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 4.4](#).

3.1 NLCA – SECTIONS 12.5.2 AND 12.5.5

Where appropriate, the EIS shall contain information with respect to the following as per Section 12.5.2 of the NLCA:

- a) Project description, including the purpose and need for the Project;*
- b) Anticipated ecosystemic and socio-economic impacts of the Project;*
- c) Anticipated effects of the environment on the Project;*
- d) Steps which the Proponent proposes to take including any contingency plans, to avoid and mitigate adverse impacts;*
- e) 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;*
- f) Steps which the Proponent proposes to take to compensate interests adversely affected by the Project;*
- g) The monitoring program that the Proponent proposes to establish with respect to ecosystemic and socio-economic impacts;*
- h) The interests in land and waters which the Proponent has secured, or seeks to secure;*
- i) Options for implementing the proposal; and*
- j) Any other matters that NIRB considers relevant.*

Furthermore, when reviewing any project proposal, Section 12.5.5 of the NLCA requires the NIRB to take into account all matters that are relevant to its mandate, including the following:

- a) Whether the project would enhance and protect the existing and future well-being of the residents and communities of the Nunavut Settlement Area, taking into account the interests of other Canadians;*
- b) Whether the project would unduly prejudice the ecosystemic integrity of the Nunavut Settlement Area;*
- c) Whether the proposal reflects the priorities and values of the residents of the Nunavut Settlement Area;*
- d) Steps which the proponent proposed to take to avoid and mitigate adverse impacts;*

- e) Steps which the Proponent proposes to take, or that should be taken, to compensate interests adversely affected by the project;*
- f) Posting of performance bonds;*
- g) The monitoring program that the Proponent proposes to establish, or that should be established for ecosystemic and socio-economic impacts; and*
- h) Steps which the Proponent proposes to take, or that should be taken, to restore ecosystemic integrity following project abandonment.*

PART II – THE ENVIRONMENTAL IMPACT STATEMENT

4.0 GUIDANCE ON THE PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT

4.1 PRESENTATION

The Proponent shall provide an EIS that is complete and which provides sufficient information to identify, describe and determine the significance of potential impacts on the ecosystemic and socio-economic environments that could arise from the Project. The EIS should include scientific works, subject-specific studies and all other sources of information covering all aspects of the Project in regards to ecosystemic and socio-economic perspectives.

For clarity and ease of reference, the EIS should be presented in the same order as the EIS Guidelines. However, the NIRB recognizes that flexibility in the arrangement of the document may be required and the Proponent is encouraged to use its judgment and best practices in designing a document that is arranged and formatted to facilitate ease of reviewing while ensuring that all the information requested in these guidelines are provided. In the interest of brevity, the EIS should make reference to, rather than repeat, information that has already been presented in other sections of the document. An index is recommended to reference locations in in the text by volume, section, sub-section and page.

The EIS shall be made available to the NIRB electronically on searchable CD-ROM, and also in hard copy. 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 5 MB in size (using only low resolution images). If the Proponent determines that certain files are better presented with larger resolution, than these files should be submitted to the NIRB; however it should be noted that these files may only be distributed by the NIRB to the public upon request.

4.2 CONFORMITY

The Proponent is expected to observe the intent of these Guidelines and to identify all significant environmental effects that are likely to arise from the Project (including situations not explicitly identified in these Guidelines), the mitigation measures that would be applied and the significance of any residual effects, which will then lead to the preparation of an EIS. Specific issues or directions described in the Guidelines must be easily identifiable in the EIS. In accordance with the NIRB's *Guide 7: Guide to the Preparation of Environmental Impact Statements* ([NIRB, 2006b](#)), the EIS shall contain a concordance table directing reviewers to the location (document, section, and page number) where specific information addressing the Guidelines and the NIRB's Minimum EIS Requirements may be found. This concordance table shall include an indication of what information, details, data, etc. the Proponent will defer from its current submission and plan to include within the Final EIS. For each item, the Proponent is requested to provide a reference to the appropriate EIS Guideline section for the ease of parties'

review. Where the Proponent is unable to provide information until the FEIS stage, it shall further provide within this table, its rationale for deferring the inclusion of such information.

The Proponent is cautioned that any significant deviation from these Guidelines may result in a negative conformity decision and subsequent requirements for revision. It is possible that the EIS Guidelines include matters that, in the judgement of the Proponent, are not relevant or significant to the Project. If that definition of such matters results in omissions from the EIS, they must be clearly indicated and the Proponent should explain and justify their reasoning for each omission identified, so that the public and other interested parties have an opportunity to comment on this judgement. Where any differences in direction are encountered between the NIRB's *Guide 7* ([NIRB, 2006b](#)) and the EIS Guidelines issued under NLCA Section 12.5.2, it may require the Proponent to provide the additional information. The Proponent is advised to consult with the NIRB on any issues within these Guidelines on which it plans significant deviation.

4.3 LENGTH

In accordance with the NIRB's *Guide 7* ([NIRB, 2006b](#)), the Proponent's EIS Main Document (*i.e.*, Volume I) shall be concise and not exceed 150 pages without permission from the NIRB. The 150 page limit shall not include: the Title Page, Executive Summary, Popular Summary, Glossary, Table of Contents, Concordance Table, Consultants and Organizations and References. To ensure the main document within the EIS report remains manageable for reviewers, communities, and the general public, any data of a detailed nature shall be contained in separate volumes as appendices and technical reports submitted in supporting documents of the main document. The Proponent must also submit a list of all documents and supporting maps and tables for reference.

4.4 FORMAT

The EIS shall be double-spaced, with sections numbered, and be presented in a fully functional PDF format which supports electronic linkages between the Table of Contents and associated sections within the EIS document(s), where possible. Subject to any other instructions given by the NIRB, the following format shall be adopted, based on the NIRB's *Guide 7* ([NIRB, 2006b](#)) and adapted as much as possible to the specific circumstances of the Project. For ease of reference, the digital EIS document shall be fully indexed and searchable using keywords:

- Cover sheet with project description;
- Executive summary (in English and Inuktitut);
- Plain language summary/popular summary (in English and Inuktitut);
- Glossary (in English and Inuktitut);
- Table of Contents;
- Concordance table which lists each of the Guideline requirements and the associated location of each within the EIS;
- Purpose of, and need for, the Project;
- Detailed Project description including potential future development;
- Alternatives considered in the development of the Project proposal;

- Discussion of the public consultation initiatives with the communities potentially affected by the Project. Provide the results of the public consultation, as well as, evidence that community concerns were addressed in the planning of the Project activities;
- Baseline information and studies of the existing ecosystem and socio-economic environment;
- Anticipated ecosystemic and socio-economic impacts of the Project proposal, including potential impacts on the VECs and VSECs (and as identified through the public consultation process);
- Anticipated effects of the environment on the Project;
- Anticipated cumulative effects of the Project on the region/regions;
- Anticipated transboundary effects;
- Anticipated accidents and malfunctions, and potential effects on the environment, include contingency plans and mitigation measures;
- Steps which the Proponent proposes to take to avoid and/or mitigate adverse impacts, including contingency plans (spills, fires, floods, etc.) and adaptive management;
- Statement of residual impacts and significance;
- Steps which the Proponent intends to undertake in order to restore the area affected by the Project activities during operation and upon project closure, reclamation and relinquishment of leased land to original landowners;
- Steps which the Proponent proposes to take to optimize benefits of the Project, with specific consideration being given to expressed community and regional interests;
- The monitoring program that the Proponent proposes to establish;
- The interests in lands and waters which the Proponent has secured, or seeks to secure;
- List of permits, licenses and authorizations required to undertake the Project proposal;
- List of consultants or individuals who assisted in preparation of the EIS;
- List of agencies, organizations, and persons to whom copies of the EIS will be sent;
- Index; and,
- Supporting documentation and appendices, including a commitments table that summarizes the proposed mitigation and other company commitments with cross reference to environmental issues or potential impacts.

4.5 DATA PRESENTATION

Wherever appropriate and useful to clarify the text, the Proponent shall provide charts, diagrams, photographs, and maps (which clearly define land ownership, scale and north arrow) within the EIS document. Specifically, the Proponent shall include maps or diagrams showing all project related infrastructure and/or activities (e.g., camp sites, drilling activities, dock sites, fuel storage and laydown areas, mine site and infrastructure, transportation routes including ground transport, marine shipping and air transport, borrow pits and quarry sites, etc.). It is recommended that maps be scaled appropriately to best present materials and where feasible, should be of a common scale and projection to facilitate comparison. All charts, diagrams, photographs, and maps must be clearly referenced in the text of the EIS, especially where these may be included in a separate volume to the main EIS document.

4.6 SUMMARIES

4.6.1 Executive Summary (in English and Inuktitut)

The Proponent shall prepare an Executive Summary that describes the key Project elements and key findings of the EIS, 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. The Executive Summary shall focus 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. The Executive Summary shall form part of the EIS, but it shall also be made available as a separate document.

4.6.2 Popular Summary (in English and Inuktitut)

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 such things as 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 be presented in English and Inuktitut. The Popular Summary shall form part of the EIS, but it shall also be made available as a separate document.

4.7 TRANSLATION

In addition to the Executive Summary, Popular Summary and Glossary being presented in English and Inuktitut within the EIS, the summary for each thematic volume shall also be translated into Inuktitut. Maps shall indicate common and accepted place-names usually referred to by the local populations in their own language, in addition to official toponyms, especially where traditional Inuit place-names have been made official through the process outlined in Section 33.9 of the NLCA.

5.0 INTRODUCTION

5.1 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/or how it applies to all businesses for which the Proponent 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., exploration, open pit and underground mining, transportation networks

involving air shipping, marine shipping, and winter and all-weather road components, etc.). The Proponent should pay particular reference to:

- Its record of compliance with governmental policies and regulations pertaining to environmental and socio-economic issues in past operations;
- Operation 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;
- Relations with Aboriginal peoples, including prior experience with any Impact and Benefits Agreements if appropriate;
- Operations in Arctic and Sub-arctic regions;
- Its record in incorporating environmental and socio-economic considerations into construction, operations, maintenance, temporary closure (care & maintenance), final closure (decommission & reclamation), and post-closure; and
- Corrective actions 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 exploration, mining, or transportation networks, particularly within this region, 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 that lack.

5.2 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 NLCA may be excluded from this discussion.

5.3 REGIONAL CONTEXT

The Proponent shall describe in general terms the regional biophysical and socio-economic environments of the Kivalliq 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.

5.4 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 be limited to, file numbers, start and end dates, fees, name of right holder and any post-authorization amendments and/or renewals.

5.5 ANALYSIS OF NEED AND PURPOSE OF THE PROJECT

The following points must be addressed in discussing the need for and purpose of the Project:

- General feasibility from an economic perspective, including how this 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 lend to transportation 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 that are not related to economics.

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.

6.0 PROJECT COMPONENTS AND ACTIVITIES

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

6.1 PROJECT DESIGN

General Project design issues 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, hydrogeological and oceanographic conditions. This discussion should also include current land use activities;
- A discussion on how the potential of climate change 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 eco-systemic integrity, focusing on various 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;
- How potential impacts to wildlife (e.g., caribou, polar bear and peregrine falcons) have influenced the design of the Project, indicating methods designed to minimize impacts to wildlife, including the geographical location of project components. Special attention should be paid to the influence of peregrine falcon habitat on the selection of borrow pits and quarry sites (where applicable);
- 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, employment policy, etc.
- 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;
- How public consultation and TK 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.

6.2 PROJECT PHASES

The Proponent is required to present an overall development plan which describes the Project development phases [site preparation, construction, operation, maintenance, any potential modifications, temporary closure (care & maintenance), final closure (decommission & 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 in the possibility that operations are unexpectedly suspended. The Proponent should also identify all associated monitoring and/or mitigation plans to be implemented in each of the development phases to eliminate or minimize adverse effects that might occur at various project stages for each Project element.

6.3 FUTURE DEVELOPMENT

The Proponent shall evaluate any foreseeable expansions of the current Project, the needs of required infrastructure, and associated eco-systematic and socio-economic impacts. The Proponent shall also evaluate the potential for development of additional ore deposits in the Project area in accordance with previous and current exploration activities. Such an evaluation should be based on the Proponent's business and strategic plans for the Project, other predictions and the comparable development realized by projects of a similar nature.

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.

6.4 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 the rejection of other alternatives. Through the course of its alternative assessment, if the preferred option 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 as filed with the Board.

The EIS shall present alternatives for all Project components with a focus on the following project elements:

- Options for proposed construction of the all-weather road should the potential Phase 1, 12.10.2(b) exception not be granted and thus, should construction not be allowed to proceed within the timing that has been proposed (if required);
- Options proposed for the transportation of supplies from the south to Rankin Inlet for both air and shipping;
- The location of the Rankin Inlet Tank Farm and Storage Facility;
- Access to all identified ore deposits by underground or open pit methods and include potential infrastructure layouts;
- Alternative road access to all identified ore deposits for transportation or ore and equipment required at each deposit;
- Alternatives for processing the ore;
- Alternatives for cyanide;
- Alternatives for tailings storage (The Proponent is encouraged to refer to Environment Canada's *Guidelines for the Assessment of Alternatives for Mine Waste Disposal* ([September 2011](#)) when assessing and presenting alternatives for mine waste management, including tailings and waste rock storage options);
- Diesel power generation, including solar energy, wind energy, hydro and geothermal energy, etc.;
- Closure and reclamation options;
- Mine waste management and disposal (The Proponent is encouraged to refer to Environment Canada's *Guidelines for the Assessment of Alternatives for Mine Waste Disposal* ([September 2011](#)) when assessing and presenting alternatives for mine waste management, including tailings and waste rock storage options);
- Tailings and waste rock storage/disposal alternatives (The Proponent is encouraged to refer to Environment Canada's *Guidelines for the Assessment of Alternatives for Mine*

Waste Disposal ([September 2011](#)) when assessing and presenting alternatives for mine waste management, including tailings and waste rock storage options);

- Methods for site water treatment (i.e., mill, sewage, tailings, stormwater treatment etc.); and,
- Methods for mine de-watering.

When the Proponent assesses the economic viability for each alternative option, due consideration must be given to the 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 should reflect 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 potential for impacts from each alternative under consideration should also be discussed within the context of potential interactions with other past, present and reasonably foreseeable developments in the RSA (i.e. cumulative effects), in accordance with [Section 7.11](#). The potential cumulative effects for each alternative should be presented in enough detail so as to be comparable with the assessment for the identified “preferred alternative”.

Furthermore, as indicated in the public consultation section ([Section 7.1](#)), public opinions and preferences shall also be taken into consideration as a criterion in the assessment all the alternative options. Therefore, the alternative analyses shall include a discussion on 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.

6.5 ECONOMIC AND EMPLOYMENT INFORMATION

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

- Capital costs, estimated operating costs, and the total expected revenues (current market values);
- The number of person years of work, broken down by Project 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 Rankin Inlet 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 programs).

6.6 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; from site preparation through to construction, operations, maintenance, any potential modifications and/or expansions that may be required during the operations phase based on exploration results, temporary closure (care & maintenance), final closure (decommission & 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. Where specific codes of practice, guidelines and policies apply to items to be addressed, in particular if involving thresholds and quantitative limits to be applied, those documents must be cited and may 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.

The description shall include the following project components and associated activities, and other information as deemed necessary by the Proponent.

6.6.1 Tiriganiaq, Wesmeg, Wolf, F Zone, Pump and Discovery Mine Sites

6.6.1.1 Geology/Mineralogy of the Ore Deposit

The Proponent shall describe the ore resources at all six mine sites, including where appropriate:

- Deposit locations, including detailed maps of the mine site areas;
- Detailed structural geology maps;
- The lithology and mineralogy in the Project area;
- Presence of ice lenses and implications to the Project;
- Fractures and their implications to the Project;
- Types of the deposits and associated bedrocks;
- Average and range of ore grades estimated for the deposits;
- Nature, depth, and thickness of the ore deposits to be mined;
- The mineralogy and geochemistry of ore and waste rock including acid rock drainage (ARD) and metal leaching (ML) potential as well as the acid neutralizing potential; and,
- Ore body delineation.

6.6.1.2 Mining, Transport and Processing

The Proponent shall describe the ore mining, transportation and processing associated with the Project, using maps and diagrams whenever applicable:

- A mining plan indicating the sequence of development for the proposed open pits and underground mines at Tiriganiaq, Wolf, F Zone, Wesmeg, Pump and Discovery;
- Describe the open pits and underground mine design, operation, and processing including site layout, mine water management, anticipated production rate, designed production capacity, production schedule, equipment selection, energy consumption and energy efficiency measures;
- Provide and describe flow sheets depicting ore processing, material flow and waste stream, energy consumption and water consumption;
- Describe the hydrogeological conditions (*i.e.*, permeability of geological formations, hydraulic head and groundwater flow direction, surface waters) of the open pits and the underground mines, including estimates of the variance in permeability and groundwater flow, and implications of geological anomalies such as fault zones, weak rock formations or areas of higher than expected groundwater flow on the design of the open pits and underground mining facilities;
- Discussion on how permafrost conditions (seasonal thawing, taliks, degradation due to mining disturbances) were considered in the design of the open pits and underground mining facilities;
- Stability analysis of the pit slopes and underground mine works and provision of adequate ground control measures where necessary;
- Design of the impoundment/retention structures and measures for run-off and seepage control;
- Design of the mine ventilation for the underground mine;
- Daily and yearly average extraction rate(s) and quantities of ore;
- Cut-off grades, in percent of ore, mineralized low grade material and non-mineralized material, based on current economic conditions or reasoned projections;
- Means of drilling, blasting, extraction, loading and transport of ore;
- Design, location and capacity of run-of mine stockpile (if any), ore stockpile and waste rock stockpile facilities;
- Dust suppression technologies and dust suppressants to be used in mining, loading, transportation, storage, crushing and other processes where dust might be generated;
- A review of similar operations elsewhere in similar settings, with a discussion of the results of research on the long-term stability of the underlying permafrost and frozen materials, as well as the implications to Project planning and design;
- Measures and plans to control natural hazards and/or mitigate their impacts on the Project, such as rock falls and collapses, extreme climate events, and other geological or geomorphological events (*e.g.*, storm, flooding, and earthquake);
- Provide a comprehensive description of the proposed mill design, including:
 - Facilities and structures include plant layout plans;

- Mill process and operations for ore processing;
- Reagents used; and,
- Water management strategies, including methods to maximize water re-use, minimize takings of natural waters and energy consumption.
- Provide a discussion of proposed options for transporting the final gold product from site.

6.6.1.3 Ore Stockpile Facilities

The Proponent shall present, in connection with its Ore Storage Management Plan ([Subsection 9.4.5](#)), details on the ore stockpile facilities associated with the Project, using maps and diagrams whenever applicable, including the following:

- Anticipated quantities and grade of ore extracted, including daily and yearly average extraction rate(s);
- Description of various ore grade handling, including the design, locations and capacities of the stockpile site(s). The Proponent shall include references to similar operations in comparable conditions, applicable modelling information, and the results of research on the short and long-term thermal stability of the underlying permafrost and frozen materials;
- Description of the physical and chemical stability of the ore material to be stored, with regard to the long-term ARD and ML potential of the ore material. Consideration should be given to the latest monitoring results from mines in the same general climatic conditions;
- Explanation of the relationship between the timing of ARD/ML and permafrost encapsulation in cold weather conditions, with consideration for potential climate change; and,
- Description of run-off and seepage prevention/control structures.

6.6.1.4 Water Supply and Water Treatment Facilities

The Proponent shall present the details on all water supply and water treatment facilities associated with the Project, including the facilities at the mine site(s) and the Rankin Inlet spud barge and tankfarm and laydown area. The Proponent should include the following:

- Identification and description of water supply sources (waterbodies and/or watercourses) and intake sources and facilities, and projections of volumes of water required from each source;
- Description of water uses and volumes including those for camp sites, open pit and underground mines, dock facility, mill processing facility, dust suppression, firefighting reserves, workshops and maintenance facilities as well as drilling activities, etc.;
- Description of water treatment process methods for all fresh water use (*i.e.*, mill processing and domestic water), including the design of the facility(ies);
- Design features to prevent the entrapment of fish at water intakes, on-site use, storage and final discharge to the environment;
- Description of the facilities for washing mine trucks and other equipment, as well as any treatment of water to be used for such activities; and,

- Description of plans to recycle or re-use water resources.

6.6.1.5 Natural Drainage Diversion

The Proponent shall present, in connection with its Site Water Management Plan ([Subsection 9.4.4](#)), the details on any required alteration of drainage patterns and diversions, including the following:

- Description of any planned alteration of drainage patterns and/or diversions of natural drainage from mine site and Project facilities, and estimation of the flows to be diverted;
- Discussion of measures to prevent or mitigate sedimentation within these diverted flows;
- Discussion of potential challenges anticipated in constructing drainage diversions including seasonal effects (e.g., melting ice lenses); and,
- Discussion of the potential for mobilizing sediments, generating erosion and disturbances to terrain/landforms.

6.6.1.6 Mine De-Watering

The Proponent shall present, in connection with its Site Water Management Plan ([Subsection 9.4.4](#)), the details on mine de-watering required for the Project, including the following:

- Description of proposed de-watering methods and design of the mine water handling system for the open pits and underground mine including a discussion of the potential uses for the mine water;
- Description of proposed de-watering methods including a discussion of the potential uses for the water and disposal method(s) should there be a need to dispose of any water resulting from de-watering;
- Description of proposed geotechnical works, the areas that may be affected, the quantities of bottom sediment requiring disposal, and the proposed disposal methods;
- Estimates of average mine water volumes, methods used to calculate volumes, and discussion of potential uses for mine water;
- Prediction of the maximum inflow into the open pits and the underground mine during mining, including estimates of variance and likelihood of estimates. The pumping capacity should be designed by taking into consideration the predicted maximum inflow. Measurements for controlling any necessary inflow should be discussed, in addition to describing the groundwater monitoring program; and,
- Anticipated salinity and general characterization of water from each pit, including estimates of the variance of water quality.

6.6.2 Rankin Inlet Tank Farm, Itivia Dock and Storage Facility

The Proponent shall provide the following information regarding Project components and activities for the proposed Rankin Inlet Tank Farm and Storage Facility, with site maps, diagrams and general arrangement drawings provided for reference purposes where deemed useful, as well as an analysis of alternatives if the Itivia dock is not able to be utilized as proposed:

- Discussion of how the precautionary approach has been incorporated into the design of storage facility and utilization of the existing Itivia dock, to account for the challenges of the Project area including considerations for extreme temperatures, ice thickness, seismic hazards, and water level change, in the layout and structure of various facilities and design features (where applicable);
- Discussion of the study results related to bathymetry, rock and sediment geotechnical properties, and sediment thickness and quality for the proposed dock site (if required);
- Discussion on how annual rebound influencing water depth, and the ice shifting on ocean and/or bay during freeze-up in the fall season, winter season and break-up in the spring season will affect the design and usage of the dock facility;
- Description of any transfer sites of materials from ships to barges;
- Description of all facilities proposed to be constructed at the storage facility, including discussion on the wharf storage facility, administration facility, land-based or water-based navigational aids, etc. (where applicable);
- Details regarding all undertakings/works required to make the selected storage facility accessible for shipping and access to Phase 2 of the all-weather road;
- Discussion of all potential uses of the dock site and storage facilities, including predicted non-Project and/or private uses;
- Description of all facilities associated with the transfer and handling of fuel and any hazardous products;
- Description of the types and anticipated volumes/quantities of materials and equipment to be transported to and from the dock, including hazardous/dangerous goods cargo;
- Description of spill contingency plans for the dock and tank farm/storage facility;
- Description of the communication system and power generation unit to be employed; and,
- Discussion of plans for storage facility security management.

6.6.3 Waste Management Facilities

The Proponent shall describe the sources, types and quantities of waste predicted to be generated by the Project, and the on-site processes for the collection, handling and disposing of wastes to be generated by the Project. The Proponent shall include the following with cross referencing to applicable management plans ([Section 9.4](#)) where appropriate.

6.6.3.1 Waste Rock Facilities

- An inventory of waste rock generated during construction and operation of the Project including; overburden, waste rock, low grade mineralized material, processing wastes, excavated material, and any other related wastes if applicable;
- Description of overburden and waste rock handling, including the design, locations and capacities of the stockpiles sites, describing the options for each type of waste rock. The Proponent shall include references to similar operations in comparable conditions, applicable modelling information, and the results of research on the long-term thermal stability of the underlying permafrost and frozen materials;

- Description of the physical and chemical stability of the types of materials to be stored and those to be used for containment construction, with regard to the long-term ARD and ML potential of the waste rock. Consideration should be given to the latest monitoring results from mines in the same general climatic conditions;
- Details regarding the ARD and ML characterization of waste rock, the method of testing in terms of both static and kinetic tests, the number of samples and sampling protocols, the company and personnel to carry out the tests, and implications to possible use and disposal;
- Description, in qualitative and quantitative terms of the chemistry of frozen groundwater from joints and fractures in the waste rock disposal area; and,
- Explanation of the relationship between the timing of ARD and ML and permafrost encapsulation in cold weather conditions, with consideration for potential climate change; and,
- Estimation of the quantities of potential acid generating (PAG) and non-PAG materials that will be generated and details of the methodology used in classifying PAG and non-PAG.

6.6.3.2 Tailings Management Facilities

- Description of the tailings management facilities design;
- Description of how geotechnical factors, geological characteristics (weak rock formations, fault zones and their hydrogeological characteristics), and permafrost conditions (seasonal thawing, taliks, degradation due to tailings disposal, and long-term evolution) were considered in the design of the tailings management facility(ies);
- Description of how the general climate conditions including climate trends were considered in the design of the tailings management facilities (e.g., prevention of ice formation);
- Description of the proposed process and operations of the tailings management facilities during both operations and post-closure. The Proponent shall include a contingency plan in the event that discharges from the containment area do not meet licensing criteria;
- Description of seepage and run-off prevention and control structures and designs; and,
- Description of the tailings chemistry, physical properties (rheology, solid content, consolidation density, slurry temperature, volume estimates), mineralogical characteristics for long and short-term ARD and ML potential.

6.6.3.3 Waste Water Treatment Facilities

- Description of the water treatment process for all major sources of water from the Project, including process effluent, open pit water, underground mine water, site, waste facilities and stockpile drainage/runoff, and sewage/grey waste water;
- Description of proposed mine water (i.e., process effluent, open pit water, underground mine water, site and stockpile drainage/runoff) treatment facility to be used, to include amount of treatment sludge production and its management/storage;
- Discussion related to the treated effluent discharge methods, including the design of the facility, identification of discharge points, the anticipated water quality and quantities to

be disposed of, and conservation and recycling methods. Specific mention should be given to modifications that may be relative to operating in arctic conditions. Include associated implications for regulatory compliance;

- Description of proposed sewage/grey water treatment facilities to be used, including a discussion of the technology to be employed, the design and locations of the facilities, point(s) of discharge, solids (sludge) disposal methods, and the quality and quantities to be disposed of, as well as the applicable discharge standards;
- Contingency measures for the disposal of effluent and sewage/grey water during periods of facility malfunction and/or disturbances, with details regarding the associated disposal and treatment technologies and facilities; and,
- Description of the receiving environment including the spatial extent and magnitude of alteration of the receiving waters, how the Proponent will ensure non-toxicity, the spatial extent of the mixing zone and modelling predictions for concentrations of all parameters of concern, including the equations and assumptions on which the modeling predictions were based, at key points between the discharge point and return to baseline water quality conditions; and,
- Description of the on-site processes for the collection, handling and disposing of contaminated water wastes (including melt water) to be generated by the Project.

6.6.3.4 Landfill Facilities

- Research results for effectiveness of similar landfill operation facilities in comparable geological regions and climate condition;
- Locations of any landfill facilities, with estimates of containment capacities, associated design criteria and considerations to minimize impact on the surrounding environment. Include engineering features and facility layout drawings in relation to nearby roads, watercourses and waterbodies;
- Inventory of the types and volumes of non-combustible, non-hazardous industrial wastes to be generated and landfilled over the life of the Project;
- Inventory of the types and volumes of hydrocarbon contaminated wastes to be generated and sent south over the life of the Project;
- Description of the proposed collection, handling, storage, treatment, and/or disposal methods of contaminated ice, snow, soil, seepage and/or surface runoff without a landfarm on site; and,
- Discussion and consideration given to not having a landfarm on site as well as a description of potentially requiring a landfarm facility in the future.

6.6.3.5 Hazardous Waste

- Inventory of the types and predicted volumes/quantities of hazardous wastes to be generated or produced by the Project activities, including shipping operations;
- Description of proposed storage, transport, handling and disposal methods to be employed for hazardous waste generated; and,
- Details regarding the destinations for each type of hazardous waste, including the disposal of containers used to transport or store hazardous materials.

6.6.3.6 Camp Waste

- Description of the facilities, technologies and equipment to be used for incineration of domestic waste;
- Inventory of domestic waste to be incinerated, including both land-based and ship-based generated wastes; and,
- Description of the methods for disposal of incineration ash.

6.6.4 Ground Transportation and Associated Water Crossings

The Proponent shall describe all ground transportation options associated with of Phase 2, and include in this discussion, both temporary facilities to be used for construction purposes as well as those permanent facilities for operations and maintenance. Ground transportation includes Phase 2 of the all-weather road, access from the tank farm and storage facility in Rankin Inlet, mine haul roads, site service roads, various access roads, in-pit haul roads, other roads used to facilitate maintenance of infrastructure and facilities, etc. The Proponent shall describe the following in connection with the Roads Management Plan ([Subsection 9.4.10](#)), including relevant maps and drawings where useful:

- Design specification and features of all ground transportation roads, including construction methods and schedule, laydown areas, temporary works and construction camps, estimates and types of materials required for construction and maintenance, water crossings and diversions of watercourses;
- Discuss how previously installed or constructed portions of the road (i.e., bridges and culverts) will be managed and maintained in Phase 2;
- Discuss plans to address additional traffic on the all-weather road that will have been previously constructed (i.e., bridges, turnouts, etc.) if the development of Phase 1 of the road is granted as per NLCA 12.10.2;
- Provide a description of any infilling of lake, wetland or stream habitats associated with road construction where applicable for Phase 2;
- Discussion of design features and structures planned to protect and facilitate wildlife movement (e.g., caribou crossings and migration routes) and humans that might cross the roads during operations (including ATVs, snowmobile and sled), including a discussion of plans to prevent/minimize collision related mortalities;
- Discussion of design features and structures planned to protect and facilitate fish movement and migration;
- Describe dust suppression, methods and types of dust suppressants as well as mitigation methods for sedimentation during construction and operations;
- Discussion of how TK has been considered in the selection of the ground transportation;
- Relationship of ground transportation with existing hunting and travelling routes (including those routes in close proximity or intersecting planned ground transportation roads); and
- The duration, frequency and extent of use of all facilities, including allowances for public access and/or access for traditional pursuits.

6.6.5 Marine Shipping

The Proponent shall describe all marine shipping associated with the Project, including shipping from the eastern provinces to Rankin Inlet in connection with the Shipping Management Plan ([Subsection 9.4.11](#)), including relevant maps and drawings were useful:

- Description of the proposed marine shipping vessels (types, sizes, and numbers of vessels to be used), associated frequency and timeframe for the shipping season for all project activities during each phase of the Project. Include a discussion on the existing marine traffic volumes along the proposed shipping routes to describe the marine traffic network of the region;
- Provide an analysis of proposed shipping routes with route characteristics and navigability, with corresponding maps and details regarding bathymetry, navigational aids, other marine traffic using these routes, including channel and berthing manoeuvres, anchorage components, etc.;
- Provide a description of the transit time and delay review of alternative marine routes;
- Discussion on the potential for ice breaking during the planned shipping season (including the potential for such during break-up in the spring season and during freeze-up in the fall season);
- Relationship of marine shipping routes and seasons with existing hunting and travelling routes;
- Discussion of how TK has been considered in the selection of the shipping routes and timing of shipping activities;
- Description of the results from bathymetric studies undertaken along the proposed shipping routes. Additional discussion of study results should also be included for identified areas where shallow waters and/or strong current exist, with consideration given to the size of barges, and the implications for shipping safety;
- Identification of all parties responsible for ensuring safe shipping beyond the immediate dock facility site;
- Estimates of the volume of goods/supplies, dangerous goods, fuel, explosives and equipment to be transported and associated protocols with shipping these goods; and,
- Description of loading and offloading procedures for dangerous goods, fuel, and explosives, if applicable.

6.6.6 Air Transportation

The Proponent shall describe all air transportation associated with the Project including the following:

- Description of all potential air transportation including air traffic and types of aircraft to be used, regardless of whether an airstrip is required or not (e.g., helicopter);
- Description of all facilities and infrastructure proposed for air transportation, including construction methods and schedule, transfer and handling of fuel, etc.;
- Discussion of current drainage patterns and identification of waterbodies and watercourses that may be in-filled or encroached upon by the airstrips or airport infrastructure or diversions as required;

- Description of service roads and methods of dust suppression;
- Estimates of the number of flights on a daily or weekly basis covering all phases of the Project, including estimated flight schedules (times and days);
- The duration, frequency, and extent of use of each airport facility/airstrip/landing area;
- Estimated flight impact zones, based on flight routes, types of aircraft and traffic volumes;
- Estimates of the annual aviation and related maintenance schedules, and a description of known flight restrictions such as minimum flying height, seasonal restrictions, etc. for each aircraft type; and,
- Details regarding the proposed procedures for accident, malfunction and incident management and reporting for the transfer of hazardous material.

6.6.7 Borrow Pits and Quarry Sites

The Proponent shall provide information on all borrow pits and quarry sources required for the Project, in combination with the Borrow Pits and Quarry Management Plan ([Subsection 9.4.12](#)), and include:

- Maps for all sites that are to be used for borrow pits or quarries, indicating the ownerships [Inuit Owned Land (IOL) and Crown Land] of lands where borrow pits and quarries site are planned, and principle geographic features (e.g., on or near eskers and other unique landscapes, the proximity to waterbodies and watercourses);
- Discussion of how the borrow pits and quarry material will be extracted and how the precautionary principle has been incorporated in the design of the borrow pits and quarries in terms of minimizing potential effects to the environment, wildlife and wildlife habitats; as well as fish habitats if these sites are in close proximity to waterbodies and watercourses, and high winds;
- Characterization of the materials at potential borrow site locations including ARD and ML potential, the ground ice conditions and occurrences of massive ice;
- Estimates of the quantities of materials that will be extracted from each borrow site;
- Estimates of quantities of materials required to build the ground transportation and site infrastructure for the Project;
- Annual estimates of quantities required for maintenance associated with ground transportation, site infrastructure, and the dock site; and,
- Description of proposed sediment, dust control and erosion measures in the design of the borrow pits and quarry sites.

6.6.8 Power Generation

The Proponent shall provide the following information in conjunction with its Air Quality Monitoring and Management Plan ([Subsection 9.4.14](#)):

- The energy balance for the proposed Project, including strategies for optimization and conservation;
- Discussion on how greenhouse gas emissions will be reduced;

- Type of power generation and associated infrastructure (i.e., power lines) that will be used over the Project lifespan;
- Locations (positioning) of power generation plants/stations relative to prevailing winds and other infrastructure;
- Description of diesel power generation facilities, including sources, volumes of fuel to be used, transportation methods for fuel and associated transfer points, information regarding secondary containment measures to be employed and equipment and facilities for emergency clean-up, and,
- Proposed accident/incident management and reporting.

6.6.9 Fuel and Explosives Facilities

The Proponent shall describe the following information, in conjunction with its Spill Contingency Plans, ([Subsection 9.4.2](#)), Hazardous Materials Management Plan ([Subsection 9.4.8](#)) and Explosives Management Plan ([Subsection 9.4.13](#)):

- Location and characteristics of fuel and explosives storage and/or manufacturing infrastructure and facilities (e.g., explosives and detonator magazines, fuel storage, ammonium nitrate storage, maintenance/wash area, process trucks and their parking area, any offices, warehouses, buildings) as well as methods of secondary containment to be employed. This will include setback distances to vulnerable features (*i.e.*, dwellings, roads, camps, bodies of water, etc.), and between explosives facilities and fuel storage/handling areas;
- Types and estimate of quantities of all fuel types, explosives, and other similar materials required for the duration of the Project;
- Proposed measures to ensure the fuel used for mine related activities conforms with Canadian regulations ([Government of Canada; 1990, 1991, 1997, 1999b, 1999c, and 2002b](#));
- Operational plans including Oil Pollution Prevention and/or Emergency Plans in connection with the Spill Contingency, and Oil Handling Facility Contingency Plan; and,
- Methods of fuel transfer and transportation from sources to and around site.

6.6.10 Exploration

The Proponent shall provide the following information for ongoing exploration:

- Areas proposed for ongoing geotechnical investigations and mineral exploration, including drilling, over the duration of the various Project areas;
- Description of any exploration activities occurring on or near waterbodies and the mitigation measures that will be implemented to prevent impacts to aquatic life including fish and fish habitat as defined in the *Fisheries Act*;
- Description of any seismic methods to be used and a clear delineation of the location of such activities in proximity to water bodies (if required);
- Temporary field facilities, equipment to be used, and required ground and air transport frequencies;

- Proposed wildlife mitigation and monitoring measures associated with exploration program (e.g., compliance with the minimum flight altitudes if aerial surveys are planned or conducted, timing and type of surveys, etc.);
- Proposed mitigation and monitoring measures designed to protect archaeological and cultural resources from being impacted by ongoing exploration; and,
- Management plans for drilling waste disposal and drill site reclamation.

6.6.11 Other Project Facilities and Infrastructure

The Proponent shall describe any other relevant project facilities and infrastructure not detailed in [Section 6.6](#) including those related to site administration and personnel accommodations, for example.

7.0 IMPACT ASSESSMENT METHODOLOGY

7.1 PUBLIC CONSULTATION

As identified in [Section 2.2](#), the Proponent shall provide highlights of any public consultation and/or engagement undertaken in the EIS in order to address concerns of the general public regarding the anticipated or potential environmental effects of the Project. The Proponent shall also describe how communication was facilitated with the public through accommodating regional languages/dialects; not only through translation but through interpretation at any community or public meetings held.

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 and will enable responsible agencies to:

- Assess the transparency, meaningfulness and completeness of community consultation efforts;
- Understand messages communicated within the process of dialogue;
- Obtain an increased understanding of the expectations held within communities based upon responses to specific issues raised; and,
- Assess how public participation has influenced the development of the Project with an analysis of community support for, and opposition to, the Project.

The Proponent is expected to address concerns that are voiced regarding its own meaningful consultation and is required to:

- 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 consultations, different formats, the possible need for community meetings; and,
- Explain the findings documented within the EIS in a clear and direct manner to make the issues comprehensible to as wide an audience as possible.

7.2 TRADITIONAL KNOWLEDGE

The Proponent shall, with reference to [Section 2.3](#), present and justify its definition of TK and shall explain the methodology used to collect TK, 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 TK;
- Selection process for participants in such studies, including participants outside the NSA;
- Types of TK collected; and,
- Associated issues related to any proprietary status of TK used.

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

In all sections of the EIS, the Proponent shall discuss how it weighed and incorporated TK 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 TK 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 TK (variation between individuals) and describe how and where TK is being used to address gaps in currently available scientific data.

7.3 BASELINE INFORMATION COLLECTION

The Proponent shall present baseline data, including TK, in relation to the existing biophysical and socio-economic environments relevant to the assessment of potential impacts from the Project for all proposed phases. Potential for changes in baseline conditions due to exploration activities and the NLCA 12.10.2 exception application, if granted, related to the Project must be taken into consideration. The Proponent shall explain methodologies for baseline data collection, 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. This would improve interpretation of monitoring data in order to differentiate between natural variability and project-specific impacts. Furthermore, to ensure post-monitoring impact analysis is not confounded by temporal variation, the Proponent should incorporate reference site sampling as part of its routine baseline sampling.

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 require an intensification of corresponding monitoring and mitigation programs ([Section 9.3](#)), and follow up and adaptive plans ([Section 9.7](#)).

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 RSA.

7.4 USE OF EXISTING INFORMATION

In preparing its EIS, the NIRB expects that the Proponent will rely heavily on the use of existing information and available results of surveys and studies completed in the Project region by other developers, government agencies, organizations, institutions, regional authorities and individual researchers which may be related to the Project and the environment. For example, ‘lessons learned’ already exist in relation to 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 this should be captured by the Proponent. When using existing information to meet the requirements of various sections of the EIS Guidelines, the Proponent should either include the information directly in the EIS with clear references indicating the source of information (*i.e.*, document, section, and page numbers), or use cross-references to direct reviewers (the document, section and page number) to where they may obtain the information within the EIS or its supporting documents. The Proponent must also clarify how representative the data are, clearly separating factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from them. If conflicting information is encountered from either scientific based or TK sources, it is suggested that these conflicting viewpoints be identified and presented in a balanced manner along with the Proponents conclusions.

The EIS must clearly document any information or knowledge gaps encountered in the existing literature or other information sources, and discuss how these gaps might affect the ability to draw conclusions and the reliability of those conclusions drawn in the assessment.

7.5 ASSESSMENT BOUNDARIES

7.5.1 Spatial Boundaries

The spatial boundaries of the assessment of the Project (and its components) shall be determined on the basis of the Project’s potential impacts on the particular biophysical or social environment being addressed. In accordance with the NIRB’s definition of local and regional study areas, the

Proponent shall consider the following criteria when establishing spatial boundaries for the assessment of the Project:

- The physical or socio-economic extent of project activities;
- The extent of ecosystems potentially affected by the Project;
- The extent to which traditional and contemporary land use and other harvesting could potentially be affected by the Project; and,
- The size, nature and location of past, present, and reasonably foreseeable projects and activities which could interact with the items listed above.

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, taking into account other relevant factors such as the migratory and/or life cycle of wildlife species (where applicable), the socio-economic or other economic indicators. Identification of spatial boundaries should also take into account the impact pathways such as pollutant transport and bioaccumulation mechanisms. Furthermore, traditional and contemporary land use and occupancy (past, present, and future), should be considered in addition to other factors when determining spatial boundaries for the impact assessment of the Project.

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. For example, the spatial boundaries for archaeological studies related to burial grounds in the Project area might reasonably be expected to differ from those for studies on migration of caribou in the area.

The boundaries for the assessment of socio-economic impacts shall be based on an analysis of the socio-economic effects directly and indirectly associated with the Project. In all cases, priority focus shall be directed to potential impacts within Nunavut, but the EIS shall also consider potential impacts outside of Nunavut, wherever there is reason to anticipate that they might occur. The EIS must contain a justification and rationale for all spatial boundaries and scales chosen.

The following general spatial boundaries are suggested:

- **Local Study Area (LSA):** the Local Study Area shall be defined as that area where there exists the reasonable potential for immediate impacts due to Project activities, ongoing normal activities, or to possible abnormal operating conditions. The Local Study Area includes the Project facilities, buildings and infrastructure, and all areas proposed for Project activities, including entire proposed shipping routes in the NSA.
- **Regional Study Area (RSA):** the Regional Study Area shall be defined as the area within which there exists the potential for direct, indirect, and/or cumulative biophysical and socio-economic effects. This area includes lands, communities, and portions of Nunavut and other regions of Canada that may be relevant to the assessment of wide-spread effects of the Project. The Proponent is advised to duly consider the transboundary implications of impacts to identified VECs/VSECs as results of air transportation and marine shipping for the Project.

The LSAs and RSAs may vary between disciplines and between VECs/VSECs, as they represent the likely distribution of Project effects on individual VECs/VSECs.

7.5.2 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 that will be used in predicting change; and the temporal variability and periodicity that characterize the predicted impacts ([Whitney and Maclaren, 1985](#)). 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 & maintenance), final closure (decommission & reclamation) and post-closure periods, including planned exploration to be undertaken in conjunction with the Project. The temporary closure period (or care & maintenance) covers the period of un-timely 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 climate change (including warming trends) which might influence some of the impact assessment, 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.

7.6 VALUED ECOSYSTEM AND SOCIO-ECONOMIC COMPONENTS

The EIS should include, but not necessarily be limited to, those VECs and VSECs, processes, and interactions between the VECs and VSECs that are likely to be affected by the Project and those identified in these Guidelines. If relevant, the location of these VECs/VSECs 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 may be relevant to the Project scoping and will be given the full consideration of public input as it relates to the Project. The Proponent should consider this list in the selection of VECs and VSECs. This list is not meant to be comprehensive nor exhaustive, and should give the Proponent an appropriate starting point for the identification of relevant VECs and VSECs.

7.6.1 Valued Ecosystem Components

- Air quality;
- Climate and Meteorology;
- Noise and vibration;
- Terrestrial environment, including
 - Terrestrial ecology
 - Landforms and soils
 - Permafrost and ground stability
- Geology including geochemistry;
- Hydrology (including water quantity) and hydrogeology;
- Groundwater and surface water quality;
- 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 habitat as defined in the *Fisheries Act*
- Vegetation;
- Terrestrial wildlife and wildlife habitat, including
 - Representative terrestrial mammals (*i.e.*, caribou, caribou habitat, migration, and behaviour, muskoxen, wolverine, grizzly bears, polar bears, wolves and less conspicuous species that may be maximally exposed to contaminants)
 - Wildlife migration routes and crossings;
- Birds and their habitat including
 - Raptors
 - Migratory birds
 - Seabirds
- Marine environment, including
 - Marine ecology
 - Marine water and sediment quality
 - Marine biota including fish and Species at Risk

- Marine habitat
- Marine wildlife.

7.6.2 Valued Socio-Economic Components

- Economic development and opportunities;
- Employment;
- Education and training;
- Contracting and business opportunities;
- Benefits, royalties and taxation;
- Population demographics;
- Traditional activity & knowledge including
 - Harvesting
 - Land use
 - Food security
 - Language
 - Cultural and commercial harvesting;
- Non-traditional land use and resource use;
- Cultural, archaeological and palaeontological resources;
- Individual and community wellness, including family and community cohesion;
- Community infrastructure and public service;
- 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 VECs and VSECs, the interactions among these components, and the relations of these components with the environment. In particular, the Proponent must describe how the VECs 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 it 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 are provided.

The Proponent should validate the selected VECs/VSECs, especially those VECs/VSECs that will be used to assess the significance of Project component interactions, through consultation with the potentially affected communities. Any uncertainties in the validation must be documented. The NIRB strongly recommends that the Proponent continue to seek input from communities, government agencies and other parties, as well as to incorporate the use of TK to identify the VECs and VSECs. All VECs and VSECs used in the assessment should have clearly identified indicators as outlined in [Section 7.13](#).

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 VECs/VSECs and the interaction. These components and activities could be grouped into the following categories:

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

7.7 STUDY STRATEGY AND METHODOLOGY

In describing the study methodologies, the Proponent shall explain how scientific, engineering, 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. Where any study is presented as an independent appendix in the EIS, the Proponent should also provide an overview of the study in the main document, including the methodology used, assumptions made, interpretation of the results, limitations, and provide appropriate cross-referencing to the specific study as necessary.

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. Where the conclusions drawn from scientific and technical knowledge are in conflict with the conclusions drawn from community and/or TK sources, the EIS shall contain a balanced presentation of the issues and a statement of the Proponent's conclusions.

7.7.1 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 specify and justify all sampling protocols and statistical processes employed in both the biophysical and social context. The reliability and scope of the results, the possibility of reproducing the analyses, and quality control of laboratory analyses shall be analyzed. 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 (NGMP), as per Article 12 of the NLCA, the Proponent's

project-specific monitoring programs, as well as any regional monitoring initiatives in which the Proponent will participate. The Proponent is expected to coordinate on any initiatives undertaken by government organizations in respect to the NGMP and to liaise with the NGMP Secretariat whenever possible.

7.7.2 Data Analysis and Presentation

Use of 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 TK references shall be indicated and sources identified, or referenced appropriately in cases where TK proprietary or confidentiality concerns exist.

The Proponent shall correlate its conclusions about impact significance with relevant guidelines or regional policies; discussing with direct references any thresholds referred to or adopted from these documents.

7.8 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 significant impacts to VECs and VSECs, 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 8.0](#). Based on the predicted potential adverse effects, the proposed mitigation measures, including pollution prevention and control actions, monitoring and follow-up plans, and cross-referencing specific plans with locations of detailed information, shall be addressed in the corresponding management plans as listed in [Section 9.0](#).

The impact assessment for each biophysical and socio-economic element 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.

7.9 IMPACT PREDICTION

The Proponent shall explain and justify the methods used for impact prediction, including: mathematical or numerical modeling, statistical modeling (e.g., variance and correlation analyses), analysis of sequential series, expert opinion, previous experiences, and the prediction from known tendencies and TK if applicable.

All studies used in the prediction of impacts must be specified, the original authors identified, and the studies made public. All statements based on public consultation shall be justified and the sources and methodology specified. The choice of methodologies and interpretation of results shall be justified in light of current theories, knowledge and standards.

The Proponent shall assess the direct, indirect, short-term, and long-term impacts of the Project on the biophysical and socio-economic environments, and the interactions between them, focusing on the anticipated response of the VECs and VSECs. 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 CEA as outlined in [Section 7.11](#) 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, community and Inuit knowledge was used;
- Document model assumptions, study methodologies and sensitivity analyses;
- Document data collection methods and limitations thereof;
- Support analyses, interpretation of results and conclusions with reference to appropriate literature;
- Describe how uncertainty in impact predictions have been dealt with;
- Specify and reference sources for any contributions based on TK;
- 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 the potential residual effects and explain their significance.

7.10 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.), 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, freshwater and groundwater 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, tailings facility, etc.). In addition, the Proponent shall identify the Project

sensitivity to changes in specific climate-related parameters ([CEAA, 2003](#)). The discussion on global climate change should include:

- Effects of climate on the Project, with a focus on the design and planning of Project components and activities including: Phase 2 of the all-weather road (if granted) and related water crossings, Rankin Inlet tank farm and storage facilities, open pit mines, underground mines, waste rock stockpile, ore stockpiles and access roads;
- 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 ([EC, 2007](#)). It is recommended that the range of future climates considered by the Proponent include scenarios 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, 2007](#));
- Impacts from climate change on sensitive ecosystem features within the terrestrial, freshwater 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 Rivers, territorial or national parks), 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](#)) provides guidance for incorporating climate change considerations into an environmental assessment, and may be useful for the Proponent.

7.11 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 CEA with consideration for the following factors:

- *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 and exploration) 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 [Subsection 7.5.2](#)):* 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 Proponent should endeavour to ensure its CEA addresses the alternatives presented under [Section 6.4](#) of these Guidelines;
- *Consideration of effects on VECs and VSECs:* An effective CEA will allow 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 exploration), might impact in a cumulative fashion on selected VECs/VSECs; and
- *Evaluation of significance:* Effective CEA requires identifying and predicting 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 7.14](#).

As per the identified objectives and methodologies for a CEA, the Proponent shall:

- Justify the environmental components that will constitute the focus of the CEA. The Proponent's assessment should emphasize the cumulative effects on the main VECs/VSECs that could potentially be most affected by the Project;
- Present a justification for the spatial and temporal boundaries for the CEA. It should be noted that these boundaries can vary depending on the VECs or VSECs 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 exploration and mining-related activities but include other factors not related to 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 in order to mitigate the impact collectively.

7.12 TRANSBOUNDARY IMPACTS

Transboundary impacts, for the purpose of the current Guidelines, are defined as those effects linked directly to the activities of the Project inside the 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. 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 VECs and VSECs 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.

7.13 INDICATORS AND CRITERIA

The Proponent shall identify the indicators and/or 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 and technical experts. In its discussion of indicators, the Proponent shall emphasize the linkage between those indicators and the relevant VECs or VSECs. The indicators for the VECs should include sensitivity to contaminants and environmental pathways of exposure and bio-magnification.

7.14 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 it 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, taking into consideration and avoiding duplication of the information provided above.

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, taking 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:

- Probability of effects;
- 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,
- Identification of potential residual effects (see [Section 9.8](#))

In addition, the NIRB considers other relevant attributes in assessing the significance of an 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; and,
- The value attached to the impacted VEC or VSEC by those who identified them.

7.15 CERTAINTY

The Proponent shall also assess the degree of uncertainty 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, for example through elements of the project design, monitoring and contingency plans design, etc.

8.0 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 7.0](#)), and will serve as a basis for developing various mitigation and monitoring plans to eliminate and/or minimize the potential impacts from the Project.

8.1 BIOPHYSICAL ENVIRONMENT AND IMPACT ASSESSMENT

The Proponent shall present relevant information pertaining to the biophysical environment and associated processes to be assessed (see [Section 7.3](#)), 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, timelines 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 TK perspectives regarding ecosystem health and integrity.

In its impact assessment, the Proponent should identify and justify the thresholds or indicators, 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 6.1](#)) and environmental management systems ([Section 9.0](#)). The Proponent should also include a consideration of the temporal scale and predictions of when potential impacts to each relevant VEC could reasonably be expected to manifest.

8.1.1 Air Quality

8.1.1.1 Baseline Information

- Background air quality data and data related to atmospheric conditions collected in the LSA and RSA including where relevant airborne dust (total suspended particulates (TSP), PM₁₀ and PM_{2.5}, and/or metals), GHG emissions, hydrochloric acid (HCl), and standard air contaminants such as sulphur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), hydrocarbons, ozone (O₃), etc.;
- Current sources of potential activities which may contribute acidic precipitation; and
- Current sources of emissions and seasonal variations or climatic conditions associated with variations in air quality.

8.1.1.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities on air quality. This analysis should include the following:

- Discussion of the standards, guidelines and regulations that the Proponent will incorporate to minimize and mitigate effects to air quality;
- Predictions of principle pollution emission sources from the Project at various stages, including:

- Gaseous emissions/greenhouse gases from the fuel consumption of mobile equipment such as vehicles, marine vessels, aircrafts, and stationary equipment such as diesel generators and other combustion sources;
 - Fugitive dust and gaseous emissions from extraction and ore processing, handling, tailings, waste rock and ore stockpiling, quarries and other Project components and works; and,
 - Fugitive dust emissions from ground transportation and wind erosion at various Project components including the all-weather road, access roads and mine hauling roads.
- Assessment of dispersion of Project emissions using a LSA and RSA, using appropriate modelling, and discussion of related impacts and mitigation strategies;
 - Discussion of Project components and activities which may contribute to the potential for acidic precipitation, and an evaluation of associated effects;
 - Assessment of effects on air quality from Project emissions during various Project stages; including airborne dust [total suspended particulates (TSP), PM₁₀ and PM_{2.5}, and/or metals], GHG emissions, HCl, and standard air contaminants such as SO₂, NO_x, CO, hydrocarbons, O₃, etc.;
 - Assessment of the Project's GHG contributions to both Nunavut and Canada; and,
 - A discussion of the potential effects of changes in air quality on human health and the environment.

8.1.2 Climate and Meteorology

8.1.2.1 Baseline Information

- A description of the baseline meteorological and climatic conditions at the LSA and RSA, including methods of determination including a discussion of how data from outside the project area may have been utilized and uncertainties encountered;
- Meteorological data including but not limited to: air temperature, precipitation, evaporation and sublimation rates, wind directions and velocity, and prevailing wind directions at areas of project components and along proposed shipping route(s);
- Annual, seasonal, monthly and daily average/mean values of above noted meteorological parameters; seasonal and yearly fluctuations and variability; and extreme climate events over the same period of time in which the data, including site-specific data are collected in the RSA of the Project; and,
- Prevalent trends related to VECs in the Project area and any resulting implications to the Project.

8.1.2.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities, on climate and meteorology. This analysis should include the following:

- Discussion of the relationship between climate change and GHG emissions from the Project; and,

- Discussion on the climate parameters that may change due to emissions [GHG, HCl, and criteria contaminants such as SO₂, NO_x, CO, volatile organic compounds (VOCs), O₃, etc.] from the Project.

8.1.3 Noise and Vibration

8.1.3.1 Baseline Information

- Description of baseline noise and vibration levels in the Project area, including a discussion on variability, and if applicable, the relationship between these parameters and local weather conditions, seasonal variations, etc.;
- Review of available studies/research the potential impacts of noise and vibrations on wildlife behaviours and health in both terrestrial and marine environments, with a focus on noise from similar mining and shipping operations, in comparable climate and geographical regions if possible. Emphasis should be placed on level of noise and the identification of noise sensitive species, timing, etc.; and,
- Review of available studies/research on the potential impacts of noise and vibrations from blasting in or near freshwater and marine environments.

8.1.3.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities, on noise and vibration. This analysis should include the following:

- Description of anticipated noise and vibration levels from all relevant Project equipment and activities;
- Discussion of the standards, guidelines, thresholds and regulations that the Proponent will comply with to minimize and mitigate impacts associated with noise and vibrations;
- Potential increase to atmospheric noise levels from Project activities at different project stages, including those contributions arising from:
 - Ground transportation, including mine traffic, other access roads and the public where applicable;
 - Air transportation;
 - Equipment use at mine and construction sites, including power generators;
 - Mine site operations: blasting, drilling, crushing, screening, milling, smelting, transportation and stockpiling activities;
- Potential changes in marine noise levels due to shipping activities, as well as noise propagation in the marine environment; and,
- Potential impacts of noise and vibration on the following:
 - Humans in close proximity to noise generating sources;
 - Terrestrial wildlife, with a focus on caribou and migratory birds;
 - Marine mammals; and,
 - Fish in fresh water and marine environments.

8.1.4 Terrestrial Environment

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

8.1.4.1 Baseline Information

- Description of existing unique or valuable landforms (e.g., eskers, fragile landscapes, wetlands), including details regarding their ecological functions and distribution in the LSA;
- Description of existing or proposed protected areas, special management areas, and conservation areas in the RSA;
- Discussion of the landforms and topographic features at areas proposed for construction of major project components, including the type, thickness, and classification and distribution of soils as applicable;
- Description of the bedrock lithology, morphology, landform and soils (including sediments and the thermal and ground ice conditions) at proposed borrow and quarry sites, and other areas where earthworks are proposed. If eskers are identified as a potential source of granular material then a description of granular material properties, including thermal condition and ice content, should also be described;
- Discussion of the potential of geohazards, that may potentially affect the project or which occurrence may potentially be affected by the project (e.g., slumping, landslides, potential slippage, seismic hazards) at areas planned for Project facilities and infrastructure;
- Discussion of the relationship between permafrost processes and active layer, surface waterbodies and topography;
- Details regarding the suitability of topsoil and overburden for use in the re-vegetation of surface-disturbed areas;
- Description of permafrost distribution in the LSA, including areas of discontinuous permafrost, high ice-content soils, ice lenses, thaw-sensitive slopes, and talik zones;
- Description of permafrost temperatures at areas planned for Project facilities and infrastructure, including discussion of sensitivity to climate change, and implications for stability and safety of infrastructures;
- Collection of site specific thermal properties such as thermal conductivity, heat capacity, and latent heat, etc. of permafrost soils and permafrost rocks; and,
- Sites of paleontological or palaeobotanical significance within the LSA.

8.1.4.2 Impact Assessment

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

- General impact on topography in the LSA as a result of Project development, borrow resource extraction, with a focus on sensitive landforms, and those serving as important vegetation and wildlife habitat;

- Potential impacts on the abundance and distribution of unique or valuable landforms (e.g., wetlands, eskers and fragile landscapes) from the Project;
- Potential for soil erosion, including stream bank erosion, resulting from surface disturbances associated with the Project components during all Project phases;
- Potential impacts to soil quality from compaction, the deposition of air emissions and airborne fugitive dust emissions and/or spills from the Project;
- Implications to the Project planning and design of baseline information related to terrain conditions, in particular permafrost, sensitive landforms, high ice-content soils, ice lenses, thaw-sensitive slopes, and talik zones;
- Potential impacts on the stability of terrain, in particular the thermal stability, in the vicinity of facilities and infrastructure due to the thawing of the ice-rich permafrost soils and other sensitive landforms. Discussion should focus on the potential for impacts arising from surface disturbances due to construction (e.g., overburden stripping, mine pit creation, cuts/fills, excavation) of the facility and infrastructure;
- Assessment and prediction of permafrost behaviour (degradation and its rate) beneath the pits during mining and operation of the tailings management facilities including disposing of waste rock. Long-term predictions of the thermal regime around the tailings management facilities should be conducted with the consideration of climate change. Numerical modelling should be employed for both short term and long term predictions of permafrost evolution including predictions of artesian inflow into the tailings management facilities if thawing of permafrost is envisioned; and,
- Discussion of the potential for the occurrence, frequency and distribution of terrain hazards, including snow drifts and snow banks, as a result of construction activities (e.g., cut/fill, extraction of construction materials).

8.1.5 Geology (including geochemistry)

8.1.5.1 Baseline Information

- Description of local and regional bedrock and quaternary geology. The history of the geological formations and the description of their physical, chemical and hydrogeological properties should be given. For data obtained with in-situ investigations, maps should be provided showing the location of the boreholes, with their positions relative to the planned project component;
- Description of structural geology, such as fractures and faults, at major project infrastructure areas and where earthworks are proposed (e.g., Meliadine Mine site, satellite mine site(s), Rankin Inlet Tank Farm and Storage Facility, etc.);
- Typical regional and local cross-sections of the general geology should be provided showing the geological units and their elevation, groundwater table, and linear geological structures;
- Description of the geotechnical properties of bedrock and soil units, including ice content and thermal conditions of permafrost soils and rocks, as relating to slope stability, underground stability, and bearing capacity of facility foundations; and,
- Acquisition of the in-situ stress either with in-situ investigation or from other sources with reasonable confidence.

8.1.5.2 Impact Assessment

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

- Potential geotechnical and geophysical hazards within the Project area, including potential seasonal subsidence, seismicity and faulting, risks associated with cut/fill slopes, underground excavation, and surface constructed facilities. Where appropriate, the assessment should be supplemented by analysis and illustrations such as maps, figures, cross sections and borehole logs;
- Potential effects on foundation stability of major Project components from geological fractures and faults, and associated implications of these features on project planning and engineering design. Those Project components assessed shall include, but are not limited to the docks facilities, major watercourse crossings, open pits, underground mine, and equipment pads; and,
- Risk assessment and predictions, with proposed management measures.

8.1.6 Hydrology (including water quantity) and Hydrogeology

8.1.6.1 Baseline Information

- Description of hydrology of the LSA (e.g., streams, surface water flows, subsurface water movement, ice formation, and melt patterns);
- Description of relevant hydrological regimes, drainage basins, watershed boundaries and site water balance in the RSA;
- Description of natural fluctuations, variability, and sources of variability in flow rates, including seasonal fluctuations and year-to-year variability, and the interactions between surface water and groundwater flow systems;
- Description of the timing of freeze/thaw cycles, flood zones, ice cover (seasonal patterns and spatial variation), and ice conditions and typical thicknesses, formations and melt patterns;
- Description of hydrological characteristics of streams, rivers, and lakes in each watershed of the RSA. Items listed should be considered within the context of the range of climate conditions expected (include both climatic variability such as potential for extreme events, seasonal changes);
- A conceptual and numerical hydrogeological model that discusses the hydrostratigraphy and groundwater flow systems should be presented;
- Characterization of faults and fractures within the mine area, including information about occurrence, hydraulic conductivity testing and interpretation;
- Description of interactions between permafrost, surface water and ground water, and topography, as well as rock fractures and talik zones between different surface/ground waters;
- Description of permafrost/talik distribution, permeability and hydraulic conductivity of the underlying materials; and,

- Description of existing groundwater regimes, distribution characteristics and flow paths in the Project area, including any instances of frozen groundwater within/around the identified deposits.

8.1.6.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities where applicable, on hydrology and hydrogeology. This analysis should include the following:

- Discussion of the potential impact of variable and extreme stream-flows on Project design and planning, including proposed water crossings;
- Potential impacts to existing water sheds from surface water diversions required by mine site development and other Project components (e.g., waste rock stockpiles);
- Evaluation of stormwater runoff throughout the LSA, with consideration for potential impacts to receiving waters (e.g., flow rates and flow patterns);
- Potential impacts to natural drainage patterns from the construction and operation of proposed mine facilities;
- Potential impacts on terrestrial and aquatic wildlife habitat resulting from the modification or redirection of natural flows;
- Potential for ice damming and resultant effects on other resources;
- Assessment of each water crossing and in-stream work, and potential impacts to the navigability and safety of the watercourses;
- Potential impacts to the water quality of Rankin Inlet's municipal source of water (Nipisar Lake and any additional sources);
- Potential changes to permafrost and ground ice conditions as a result of Project activities, including an analysis of the potential for groundwater inflow into the open pit; and,
- Potential changes to permafrost/talik distribution, groundwater distribution and flow paths.

8.1.7 Groundwater and Surface Water Quality

8.1.7.1 Baseline Information

- 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;
- Description of the natural hydrogeochemistry of groundwater system [pH, redox, total dissolved solids (TDS), isotopic composition, dissolved oxygen, dissolved metals anions and cations];
- Description of the physical and chemical characteristics of groundwater and surface water in the LSA, with discussion of seasonal variations of water flow and quality. Chemical characteristics should include baseline levels of contaminants and should be compared to relevant water standards/guidelines;
- Discussion of waters in the LSA of importance to local harvesting activities by surrounding communities;

- Description of lake bathymetry and limnology in the LSA; and,
- Provide baseline levels and any anticipated increases in contaminants associated with the Project in surface water and ground water.

8.1.7.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities where applicable, on groundwater and surface water quality. This analysis should include the following:

- Provide details on what the specific contaminants of potential concern to the Project are, the rationale for selecting them and for determining which will be carried forward into the impact assessment;
- 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 or for recreational purposes and the fish bearing status of identified waterbodies as well as specifically identifying any other fish bearing waterbodies. For Nipisar Lake and 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](#));
- Potential impacts on groundwater quality and surface water quality in surrounding lakes and rivers from surface runoff and seepage, traffic on Project roads, and from dust from road traffic;
- Potential impacts on groundwater quality and surface water quality of lakes and rivers from discharges of Project waste water treatment plants. A solute transport model based on numerical groundwater flow modelling should be used for ground water quality predictions and appropriate models selected (with rationale) to predict:
 - Water quality from specific sources;
 - Water quality discharged to the environment;
 - Dispersion, dilution and assimilation of effluent discharged to the environment;
- Potential impacts on groundwater quality and surface water quality from ARD and ML resulting from waste rock stockpiles, ore stockpiles, open pit dewatering, construction fills, embankment of roads, and open quarry sites;
- Potential impacts of faults on contaminant transport processes in subsurface and surface water quality;
- Potential impacts on surface water quality of nearby lakes and streams as a result of nutrient input from blasting activities;
- Potential for increases in suspended sediments in waterbodies as a result of construction and maintenance of the mine facilities, all-weather road and associated water crossings;
- Potential impacts on surface/ground water quality from runoff at fuel storage facilities, with consideration for possible fuel spills and malfunctions;
- Potential impacts on ground and surface water quality from accidental spills of fuel and chemicals along the ground transportation routes;

- Potential impacts on surface water quality from the deposition of particulate matter resulting from the incomplete combustion of wastes from incineration;
- Potential impacts on groundwater and surface water quality in relation to other site waste management activities, including: storage, handling, landfilling of waste; landfarming of contaminated ice, snow and/or soil; the management of historical contaminated material (e.g., previous spills, mishaps, releases, etc.), and sewage effluent discharges;
- Potential impacts on surface water quality from construction and operation of camps;
- Potential impacts of erosion associated with the all-weather road on surface water quality as a result of vegetation removal, cuts/fills and other surface disturbances; and,
- Potential impact of ongoing exploration activities on surface water quality from drilling water withdrawals and returns.

8.1.8 Sediment Quality

8.1.8.1 Baseline Information

- Description of the physical and chemical characteristics of the sediment quality in the LSA;
- Description of sedimentation rates and dispersion patterns of waterbodies within the LSA; and
- For the sedimentation deposition rates, flow models and sediment dispersion models should be provided that outlines not only the rate of sediment deposition but also the location. Provide linkage of this baseline information with the hydrology baseline information ([Subsection 8.1.6.1](#)).

8.1.8.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities where applicable, on sediment quality. This analysis should include the following:

- Potential impacts on sediment quality in surrounding lakes and rivers from surface runoff and traffic on Project roads and dust from road traffic and other project sources;
- Discussion of fluvial processes and stability as related to proposed water crossings;
- Potential sedimentation and infill rates of drainage areas that might be impacted by the Project;
- Potential impacts on sediment quality of lakes and rivers from discharges of Project waste water treatment plants;
- Potential impacts on sediment quality from ARD and ML resulting from waste rock stockpiles, ore stockpiles, open pit dewatering, construction fills, embankment of roads, and open quarry sites;
- Potential impacts of erosion associated with the all-weather road on sediment quality as a result of vegetation removal, cuts/fills and other surface disturbances;
- Potential impacts on sediment quality of nearby lakes and streams as a result of nutrient input from blasting activities;

- Potential impacts on sediment from runoff at fuel storage facilities, with consideration for possible fuel spills and malfunctions;
- Potential impacts on sediment quality from the deposition of particulate matter resulting from the incomplete combustion of wastes from incineration;
- Potential impacts to sediment quality in relation to other site waste management activities, including: the storage, handling, landfilling of waste; landfarming of contaminated ice, snow; the management of historical contaminated material (e.g., previous spills, mishaps, releases, etc.), and sewage effluent discharges; and
- Potential impacts on sediment quality from construction and operation of camps.

8.1.9 Freshwater Aquatic Environment

For the purpose of the current Guidelines, freshwater aquatic environment includes aquatic ecology, aquatic biota (including representative fish as defined in the *Fisheries Act*, aquatic macrophytes, benthic invertebrates, and other aquatic organisms) and habitat including fish habitat as defined in the *Fisheries Act*.

8.1.9.1 Baseline Information

- Description of the limnology, freshwater biota, presence of fish and other freshwater species (with emphasis on species that perform particularly significant ecological functions), associated habitats and habitat distribution in the RSA and the LSA. This description should be based on the results of baseline information collected from studies, available published information and/or information resulting from community consultations;
- Description of the biological composition of freshwater aquatic environments in the LSA, including: trophic state, periphyton, macrophytes, phytoplankton, zooplankton, benthic invertebrates, fish, and the interactions and relative significance of each trophic level identified in the food chain;
- Description and population distribution of fish species in the LSA with a focus on arctic char, lake trout, and arctic grayling, and including the potential seasonal and annual trends in abundance and distribution of species, their migratory patterns, routes and preferred corridors, and the corresponding sensitive periods when routes include habitats potentially affected by the Project;
- Characterization of habitat requirements for each fish species, including areas used for spawning, rearing, feeding and over-wintering, and any sensitive times for these activities;
- Description of existing freshwater habitat in waterbodies and watercourses (including littoral zones, aquatic and riparian vegetation, lake bottom characteristics, fish overwintering areas, the estimated productive capacity, etc.) within the LSA;
- An overview of fish species, populations, distributions and ecologies in the RSA, with emphasis on identified fish VECs and species with special designations (Species at Risk listed on Schedule 1 of the federal SARA and species with designations by the COSEWIC) or any populations of any rare or regionally unique fish species and habitats

within both the LSA or RSA. This description should include reference to species having significant ecological functions, and/or importance for Inuit life and culture;

- The health of fish VEC indicator species populations and their contaminant loadings; and
- Discussion of any other issues relating to freshwater aquatic species or habitat identified through public consultation.

8.1.9.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities, on the freshwater aquatic environment. This analysis should include the following:

- Potential impacts to fish, invertebrates, aquatic macrophytes, and freshwater habitat including potential impacts to water and sediment quality. Consideration should be given to impacts associated with the following: water withdrawals; discharge; redirection of natural flows; explosives use; nutrient and contaminant inputs; and sewage and grey water effluent discharge;
- Potential direct or indirect effects on fish and invertebrate biota and habitat of both, including aquatic species at risk, from any changes to the aquatic or riparian environments, as a result of any in-water works or Project activities in close proximity to waterbodies;
- Potential impacts to fish due to blasting in or near waterbodies, including noise and vibration impacts;
- Potential impacts to fish and fish habitat from any infilling of lake, wetland or stream habitats associated with road construction(s);
- Potential impacts to freshwater fish, invertebrates and habitat from planned containment structures (e.g., sediment control structures and fuel containment structures) and potential accidental spills;
- Potential impacts on identified fish habitat critical for spawning, rearing, nursery and feeding, seasonal migration, winter refuges and migration corridors;
- Evaluation of the ability of fish to pass at water crossings along access roads;
- Potential impacts to fish health, distributions and populations especially taking in to consideration contamination and fugitive dust and potential impact to human health due to consumption of these fish; and
- Quantitative assessment of the ecological risks to freshwater VECs from the potential elevated contaminant loadings as a result of the Project.

8.1.10 Vegetation

8.1.10.1 Baseline Information

- Description of ecological zones, and other relevant classifications of plant associations and phenologies in the LSA;

- Description of the vegetation/plant types in the LSA, including estimated percentage cover and height for principal species, with a discussion on their particular significant ecological functions and/or their importance to wildlife and humans;
- An overview of vegetation species, populations, distributions and ecologies in the RSA, with emphasis 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). This description should include reference to species having significant ecological functions, and/or importance for Inuit life and culture including TK collected related to plants and plant use in the RSA;
- Details regarding associations between vegetation cover types and soil types in the LSA;
- Presentation of available published information and/or information resulting from TK studies regarding identified VECs,
- Discussion of the health status of plant species or communities in the LSA, including baseline information on contaminant levels (including metals) in representative species consumed by wildlife and/or humans, either directly (humans eating plants) or indirectly (humans consuming wildlife), and other vegetation that reflects sensitivity to contaminants or environmental pathways of exposure and biomagnification;
- Details regarding species that are culturally valuable to northerners; and,
- Any other issues related to vegetation as identified through public consultation.

8.1.10.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities, on vegetation. This analysis should include the following:

- Potential impacts to abundance and diversity of vegetation due to Project activities;
- Potential impacts to specific vegetation coverage and species composition from construction, operation, and reclamation activities in the Project area;
- Assessment of the potential loss, disturbance, and/or changes to vegetation abundance, diversity, and forage quality as a result of Project components and activities, including potential effects from airborne fugitive dust fall, airborne contaminants from emission sources, and changes to water quality and quantity, permafrost, or snow accumulation;
- Potential impacts on vegetation abundance and diversity from the transfer/introduction of invasive or exotic species into the LSA via Project equipment and vehicles, including aircraft and marine vessels;
- Potential impacts to vegetation of cultural or practical value to northerners;
- Potential direct and indirect loss of vegetation and associated habitat from construction of Phase 2 of the all-weather road (if granted) and water crossings;
- Potential impacts on vegetation quality due to soil erosion, structural soil changes, soil contamination, and fugitive dust and gaseous air emissions from mining, milling and waste management activities;

- Discussion of proposed 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 (*i.e.*, caribou);
- Discussion of the management measures for minimizing/mitigation of disturbances to plant associations, including progressive reclamation/re-vegetation plans for disturbed areas, and measures to reduce the potential for establishment of invasive species in the area; and
- Discuss the potential of invasive vegetative species (weedy species) from shipping along the shore line and along the all-weather road.

8.1.11 Terrestrial Wildlife and Wildlife Habitat

For the purpose of the current Guidelines, terrestrial wildlife and wildlife habitat includes representative terrestrial mammals including: caribou (including habitat, migration, and behaviour), wolverine, grizzly bears, polar bears, wolves and less conspicuous species that may be maximally exposed to contaminants; and wildlife migration routes and crossings.

8.1.11.1 Baseline Information

- Description of wildlife populations, distributions and ecologies in the RSA, with emphasis on identified wildlife VECs and species with special designations (Species at Risk listed on Schedule 1 of the federal SARA and species with designations by the COSEWIC). This description should include reference to species having significant ecological functions, and/or of importance for Inuit life and culture;
- Description of biodiversity within the RSA, and associated food chain relationships among terrestrial wildlife species;
- Presentation of available published information and/or information resulting from TK studies regarding identified VECs, including: the relative seasonal and annual trends in abundance and distributions; the estimated productive capacity; migratory patterns and associated corridors/routes; critical habitats on or in LSA and RSA; and sensitive periods;
- Description of the population health of identified VECs, with a discussion of contaminant loadings in representative species important to Inuit as a food source, such as caribou;
- Details regarding habitats within the LSA which are important for forage, shelter and reproduction of wildlife VECs, including terrestrial and aquatic habitats (e.g., sea ice, freshwater and marine waters);
- Identification of key wildlife habitats in the LSA and RSA as applicable, including: National Parks, Critical Wildlife Areas and other areas with legislated protection; eskers; caribou calving and nursing areas; denning sites; staging areas; and special locations as salt licks, insect relief habitats, and areas used by females and their young. Related discussion should also include migration routes, water course crossings, travel corridors and areas important for Inuit harvesting;
- Identification of habitats of any rare or sensitive species, such as Species at Risk, or those with similar designations or federal and territorial status;
- Description of the migratory patterns and routes of terrestrial wildlife VECs and the corresponding periods when these routes would be affected by the Project;

- Discussion of the relative health of VEC populations, including contaminant loading in representative wildlife VEC species, *i.e.*, caribou;
- Description of the distribution and population levels of caribou in the RSA and LSA. Consideration should be given to the cyclic nature of caribou as well as the shifts in annual caribou ranges over time, with baseline information collection covering appropriate temporal and spatial scales for an accurate understanding of current population health;
- Details regarding available information on potential impacts to wildlife associated with noise, vibrations, and dust and dust deposition from relevant scientific research and TK; and,
- Discussion of other pertinent issues as identified through public consultation.

8.1.11.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities, on terrestrial wildlife and wildlife habitat. This analysis should include the following:

- Potential general impacts on terrestrial wildlife in the LSA, including: interference with migratory routes; alienation from important habitat (e.g., denning sites, calving and post-calving areas); habitat fragmentation and general disturbance or disruption caused by Project activities;
- Potential impacts on population size, abundance, distribution and behaviour of wildlife VECs from:
 - Direct and indirect loss of habitat from the presence of and use of infrastructure, the conduct of project activities and associated sensory disturbances;
 - Direct and indirect impacts from potential degraded water quality and ground contamination, as well as airborne contaminants resulting from project facilities and associated activities;
 - Direct and indirect impacts from potential ice-breaking (prior to spring break-up or following fall freeze-up) associated with shipping activities, and ice management at the dock facility;
 - Direct and indirect impacts from climate change;
 - Where relevant, the Proponent shall take into account the alteration of normal behaviour or patterns and provide any associated outcomes for overall energy balance for the relevant VEC;
- Potential impacts on wildlife from ground traffic and air traffic disturbance, particularly low level flights (*i.e.*, lower than 610 metres) during critical periods (caribou calving and post-calving). For this impact assessment, a delineated flight impact zone could be useful in determining the potential impact of flights on wildlife, with a particular focus on critical life cycle periods and planned air traffic volume and routes;
- Potential impacts on wildlife from injury or mortality caused by Project activities, particularly the use of the all-weather road, mine hauling roads and other access roads, as well as intentional killing of wildlife to defend human life or property by mine personnel;

- Potential impacts on wildlife from increased hunting pressure resulting from improved access due to Project infrastructure;
- Potential impacts of noise and vibration on wildlife from drilling, blasting and other activities as results of Project construction and operation;
- Assessment of the potential for Project activities to act as an attractant to wildlife species, and associated effect/changes to behaviour and condition;
- Evaluation of the potential for contaminants to be released into the environment as a result of the Project and to be taken up by VEC species; and,
- Evaluation of the relative health and potential for chemical toxicity for inherently sensitive wildlife species based on an analysis of exposure pathways and demographic parameters.

8.1.12 Birds and Bird Habitat

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

8.1.12.1 Baseline Information

- An overview of bird species, populations, distributions and ecologies in the RSA, with emphasis 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). This description should include reference to species having significant ecological functions, and/or importance for Inuit life and culture;
- Description of current habitat use by VECs, including the use of Migratory Bird Sanctuaries, Key Migratory Bird Sites, and other important habitats (e.g., breeding and nesting sites and staging areas) in the RSA and along the proposed shipping routes.
- Description of the relative seasonal/annual abundances, distributions and trends in range or habitat use, movements and population status of bird VECs;
- Description of migratory patterns and routes of VECs potentially impacted by the Project, with a discussion of corresponding sensitive periods; and,
- Identification of key migratory bird sites and important bird areas along the shipping route, including those which could potentially be affected by marine spills as a result of current and/or wind patterns.

8.1.12.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities, on birds. This analysis should include the following:

- Description of 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 importance for Inuit life and culture;

- Potential disruption or alteration of migration routes due to all Project phases and activities;
- Where relevant, the Proponent shall take into account for alteration of normal behaviour or patterns and provide any associated outcomes for overall energy balance for the relevant VEC;
- Potential impacts on birds and bird habitat use from air contamination, vegetation contamination, ground contaminants or degraded water quality;
- Potential disturbances to birds from noise and vibrations as a result of blasting, and land and marine transportation;
- Potential impact from pre-determined Flight Impact Zones, and potential for collision with aircraft;
- Potential for Project facilities to attract wildlife such as polar bear, grizzly bear, wolverine, foxes, ravens and gulls that may prey upon migratory birds and resulting impacts on the migratory bird populations;
- Potential attraction of birds and other scavengers/predators by domestic waste at camp sites;
- Potential attraction of birds to Project facilities and infrastructure for roosting and nesting sites;
- Potential for bird mortality due to collisions with tall structures, overhead wires or guy wires;
- Potential effects of shipping on coastal birds and habitat, as well as potential disturbance on key migratory bird habitat areas and sanctuaries in proximity of shipping routes in the NSA; and
- Potential impacts of bioaccumulation of contaminants via the food chain.

8.1.13 Marine Environment

For the purposes of the current Guidelines, the marine environment shall include marine ecology, marine water and sediment quality, and marine biota including fish and Species at Risk, and marine habitat.

8.1.13.1 Baseline Information

- Description of marine physical processes and currents, biological diversity and composition, and associated interactions in the RSA, including the proposed shipping route(s) within the NSA;
- Presentation of available bathymetric information along the proposed shipping routes;
- Identification of sensitive habitat areas for marine fish, anadromous fish and marine mammals along the shipping routes; and,
- Presentation of TK collected related to coastal areas and ice conditions.

8.1.13.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities including its shipping activities, on the marine environment. This analysis should include the following:

- Potential risks and impacts to the marine ecosystem through the introduction of exotic species, including pathogens, through seasonal shipping with frequent voyages;
- Potential impacts on marine resources and habitat by Project phase and activities (where applicable);
- Potential impacts to marine water quality due to changes in sediment transport regime as a result of wake effects from shipping and other undertakings;
- Potential impacts of propeller wash effects to the surficial sediment and seabed;
- Potential impacts on marine water quality from ballast water discharge within Canadian waters, in particular contaminated ballast water and/or other contaminants related to marine vessel operations and maintenance;
- Potential impacts on marine water quality from: accidental spills of fuel and chemicals along the shipping routes; and from the accidental grounding/stranding of marine vessels along the shipping routes;
- Potential impact on marine environment and bio-accumulation in marine food chains, in particular on benthic organisms, from antifouling toxins (e.g., tributyltin) leaching from marine vessels; and,
- Potential impacts of climate change and sea level change on project elements.

8.1.14 Marine Wildlife

8.1.14.1 Baseline Information

- Description of marine wildlife populations, distributions and ecologies in the RSA, with emphasis on identified marine wildlife VECs and species with special designations (Species at Risk listed on Schedule 1 of the federal SARA and species with designations by the COSEWIC). This description should include reference to species having significant ecological functions, and/or of importance for Inuit life and culture;
- Characterization of marine wildlife habitat in the LSA, including habitat used by VECs for feeding, calving, nursing, over-wintering, and other critical activities;
- Identification of marine wildlife species, historical and current habitats distributions, seasonal migration patterns, critical areas (feeding area, calving areas, over winter areas, etc.), and potential interactions with shipping operation;
- Presentation of available published information and/or information resulting from TK studies regarding identified VECs, including: the relative seasonal and annual trends in abundance and distributions; the estimated productive capacity; migratory patterns and associated corridors/routes; critical habitats on or in proximity of shipping routes; and sensitive periods; and,

- Description of the population health of identified VECs, with a discussion of contaminant loadings in representative species important to Inuit as a food source, such as seals and walrus.

8.1.14.2 Impact Assessment

The Proponent is required to present a comprehensive impact analysis for all Project components and activities, including its shipping activities, on marine wildlife. This analysis should include the following:

- Potential habitat loss or deterioration during critical lifecycle stages of marine wildlife VECs, including feeding, calving and nursing due to shipping routes. 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, and/or of importance for Inuit life and culture;
- Potential direct and indirect impacts to marine wildlife, marine fish and marine habitat from marine shipping activities including increased noise levels;
- Where relevant, the Proponent shall take into account for alteration of normal behaviour or patterns and provide any associated outcomes for overall energy balance for the relevant VEC;
- Incidental spills, malfunctions and other accidents associated with shipping operations and potential impacts to marine wildlife, marine habitat and marine fish;
- Ballast water discharge, with discussion for the potential for discharge of contaminated ballast waters and related effects;
- Risk assessment of the potential introduction and intrusion of non-native, nuisance and exotic species due to ballast water discharge and ship wash;
- Potential interactions, accidental injuries and mortality of marine wildlife directly or indirectly from proposed shipping (open water and potential ice breaking during break-up in the spring and following freeze-up in the fall) activities, in particular those marine wildlife, which congregate in areas where the shipping routes would pass through;
- Potential direct and indirect effects on marine wildlife behaviour, distribution, abundance, migration patterns, species health and reproduction from marine shipping;
- Evaluation of the potential for contaminants to be released to the environment and taken up by VECs as a result of the Project; and,
- Assessment of potential residual and cumulative effects on marine wildlife VECs resulting from escalated marine traffic in the RSA over the mining lifecycle (and including the potentially extended mine operation period). Consideration should be given to the possible significant increase of marine vessel traffic along shipping routes.

8.2 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 7.3](#)), with a corresponding impact assessment covering all Project phases of development (construction, operations, temporary closure, final closure (decommission & reclamation), and post-closure). The Proponent shall also describe the components of the socio-economic environment and the processes affecting them 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 and assess 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. This is not meant to suggest that the Proponent is responsible for the current socio-economic situation of the Kivalliq Region or of Nunavut, or that it is expected to resolve any problems that are identified. Nevertheless, a proper understanding of the structure and functioning of the potentially affected societies is needed in order to identify the potential of the Project to affect them, 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 are used to present baseline information and subsequently measure impacts related to the proposed project, those indicators selected must be adequate to address all types of foreseeable impacts, including cumulative and residual impacts. The EIS shall clearly identify and justify the Proponent's selection of indicators. In addition, the Proponent should include a treatment on the temporal aspect of when potential impacts on each relevant VSEC could reasonably be expected to manifest. Finally, the Proponent is expected to clearly identify limitations and knowledge gaps encountered in its efforts to collect the information required by the following sections of these Guidelines.

8.2.1 Economic Development and Opportunities

8.2.1.1 Baseline Information

- The traditional economy, current economic structure and development trends in the Project RSA and variability in potential impacted communities as well as in Nunavut;
- The economic development levels in the Project RSA comparing to other regions in Nunavut, advantages and constraints of economy development;
- The roles of renewable resources exploit (e.g., subsistence and commercial hunting and fishing) plays in economy and its significance for local economy;
- Community and resident self-reliance; and
- Overview of 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.

8.2.1.2 Impact Assessment

- Potential impact on the local economy from regional level and community level as well as the implications of the Project on economic diversity;

- Potential impact on the traditional economic activities including hunting, fishing and sport hunting/guiding, etc.;
- Potential impacts related to accessibility and removal of barriers for traveling, fishing, hunting/trapping and other activities by local communities as a result of construction and operation of the all-weather road;
- Potential impacts on local and regional economy due to temporary closure and final closure; and
- Provide a discussion on the effects 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.

8.2.2 Employment

8.2.2.1 Baseline Information

- The labour supply statistics in terms of relative genders, ages and other demographic categories;
- Assessment of local labour force sources to satisfy the needs of the Project development at each phase, and identify gaps between availability and project needs;
- Local household incomes, income sources, and compositions of income within the Project RSA;
- Provide sector specific breakdown of employment within the NSA;
- Existing local employment opportunities and labour supply status; and,
- Discussion of the requirements for employment (e.g., education levels, criminal records, drug and alcohol policies, language abilities), and the potentials of needs to be met by local recruitment, as well as the extent to which the skills of the available workers match job requirements.

8.2.2.2 Impact Assessment

- Assessment of the potential for development of local labour force;
- Discussion of culturally-sensitive workforce management practices that will meet both the Project's immediate labour force needs as well as the region's longer-term economic development needs;
- Evaluation of the possible effect of changes in income earnings on patterns of savings, expenditure and consumption values; and
- Evaluation of the effects of competition for labour between the Project and existing businesses, institutions, and traditional activities.

8.2.3 Education and Training

8.2.3.1 Baseline Information

- Overview of the existing education system (early childhood through post-secondary);
- Available training programs for adults and youth through the existing education system;

- Local education infrastructure, capacity, funding resources, and administration system; and,
- Education and skill levels of the residents in the Project RSA, and experience of the local labour force in different demographic categories based on available data.

8.2.3.2 *Impact Assessment*

- Assessment of Project impacts to the education system and how it would influence training programs. Include an evaluation on how the Project might affect attendance, retaining teachers, class sizes, and other components of the education system;
- Provide an assessment on the demands that might be placed on the educational infrastructure, capacity, funding resources and administration system;
- Requirements for education levels, skills and experiences of labour force from the Project in short, medium term and foreseeable future, taking account the vision of expansion for the Project lifespan, and regional economy development;
- Discussion of potential need of local labour force training to meet the needs of the Project. The types of training can be those specifically required by the Project, or others geared toward universally applicable skills that improve workers' opportunities in other sectors of the economy, this assessment shall include predicted training resources to meet the designed training programs if applicable;
- Evaluation of training programs, if necessary and planned by the Proponent, associated challenges and likelihood of success to satisfy the Project needs and regional economy development with consideration of cultural and language barrier;
- Discussion of the potential for longer term community capacity building programs, if any have been planned or will be planned and are anticipated to be implemented throughout the Project's lifetime, regarding how mine training plans can enhance the transferability of skills after the mine closure (e.g., management and HR skills, computer skills, heavy equipment experience, finance skills, etc.); and,
- Discussion of other possible solutions to fill up the gap between requirements of project needs, and education level and qualifications of local labour force.

8.2.4 Contracting and Business Opportunities

8.2.4.1 *Baseline Information*

- 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 Project RSA;
- Estimates of goods supplied to the Project, including country food supply for Inuit workers at the mine, procurement, services contracting, and other business opportunities in the Project RSA that may result from the Project; and,
- The economy structure and characteristics of the local and regional economies, existing business types, scales of the different sectors of economy, and potential capacities to meet the needs of the Project.

8.2.4.2 Impact Assessment

- Assessment of economic effects stemming from the Project's contracting and business opportunities through Project lifespan, including positive and negative;
- Opportunities for local, regional, and territorial businesses to supply goods and services both directly to the Project, and indirectly to meet the demand created by the expenditure of new income by employment in the Project;
- Assessment of the Project effects on other local and regional economic sectors, in particular the competition to other business' needs due to limited capacity of local business;
- Assessment of the contributions made to public, communities and Inuit from the Project;
- Assessment of the of project-related procurement, and potential capacity to meet Project needs;
- Discussion on barriers to local business capacity building;
- Assessment of existing country food supply sources from the Project region and Nunavut, and opportunities to supply country foods for Inuit workers at the Project;
- Assessment of opportunities for local communities to diversify their economic sources and to supply new goods and services to meet the need from the Project; and,
- Potential impacts on local businesses and services due to temporary closure and final closure.

8.2.5 Benefits, Royalty and Taxation

8.2.5.1 Baseline Information

- Potential taxation revenue based on relative genders, ages and other demographic categories; and,
- Expectations and perceptions of residents in the Project RSA of potential employment at the Project.

8.2.5.2 Impact Assessment

- Evaluation of the positive impacts from increasing revenues accruing through taxes to governments, royalties and benefits to potentially impacted communities resulting from the Project;
- An annual and project total estimate of the volume of fuel that is expected to be sourced from the GN or from outside sources;
- Outline the scope, progress, and potential success of the development of an Inuit Impact and Benefit Agreement (IIBA) with the Kivalliq Inuit Association (KIA). Discussion of potential IIBA negotiations should consider all potentially impacted communities within the RSA; and,
- Any issues related to compensation required as a result of the Project.

8.2.6 Population Demographics

8.2.6.1 Baseline Information

- Description of regional and local community populations, demographics structure, composition, characteristics and population trends; and,
- Discussion of observed variations in education levels, dietary habits, religious characteristics and other social aspects in different demographic categories in the RSA.

8.2.6.2 Impact Assessment

- Potential for Project-induced demographic changes in population, migration, re-distribution and the effects of those changes, including interactions between local residents and non-residents; and,
- Potential effects from various Project phases, including unemployment as a result of temporary suspension of operations or mine closure.

8.2.7 Traditional Activity and Knowledge

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

8.2.7.1 Baseline Information

- Description of cultural, ethnic, religious, and language characteristics and diversities in the RSA;
- Local and regional economy characteristics in term of relation to traditional land use activities and wage incomes;
- Descriptions of the significance of, and level of dependence on, country food as major nutritional sources by local residents within the Project RSA; and,
- Use of caribou as a subsistence tradition, including harvesting, sustainable use of caribou, and the cultural and social activities associated therein, to specifically include hunting, community feasts, and the commissioning of arts and crafts;
- Provide an overview of local and regional land use activities in the LSA as well as areas potentially impacted by shipping activities;
- Description of current and traditional land use areas and the importance of those areas to Inuit culture and social well beings;
- Description of known land use activities and relation to the local economy, self-reliance, food supplies and livelihood; and,
- Description of identified and anticipated overlapping zones and/or areas where the land use activities co-exist or interact with Project components and activities.

8.2.7.2 Impact Assessment

- Potential effects of the Project on the harvesting of caribou and other wildlife species; including potential impacts and risks of the Project to the sustainability of caribou and other wildlife herds (*i.e.*, muskox). The risks to present and future generations of harvesters should be considered in a sustainability framework as well;
- Potential impacts to cultural and traditional values and traditional lifestyles in the communities potentially affected by the Project. This discussion should give consideration to the decreased availability of caribou and other wildlife species;
- Description on how the Proponent will comply with the *Official Languages Act*;
- Potential social-economic impacts from shipping, taking into account potential impacts to marine species on which local residents rely upon for food sources;
- Potential effects to the practices associated with a traditional lifestyle that may arise from a potentially increased level of contaminants found in traditional foods;
- Potential changes in the traditional ways of life and household function due to wage employment associated with the Project;
- Discussion of anticipated interactions between project development and land use activities by local residents in the Project RSA, in particular at the mine site, all-weather road and shipping routes;
- Potential impacts related to accessibility to areas for hunting, fishing, marine harvesting, traveling, recreational and religious activities as a result of the Project development;
- Potential effects on sustainable resource use, such as country food availability and accessibility of carving stone deposits, taking into account the CEA throughout the entire lifespan of the Project;
- Impacts to users of ice travel routes, including safety concerns as a result of new cracks caused by shipping through ice as well as the potential for ice breaking during spring break-up and fall freeze-up; and,
- Discussion of the potential impacts of the all-weather access roads to Inuit harvesting activities.

8.2.8 Non-traditional Land Use and Resource Use

8.2.8.1 Baseline Information

- Description of known non-traditional land and resource use including protected areas, visual and aesthetic resources; and,
- Description of the current tourism activities and recreational use occurring in the Project region, including a description of recreational use of the Iqalugaarjuup Nanaaga Territorial Park.

8.2.8.2 Impact Assessment

- Description of impacts to known non-traditional land and resource use including protected areas, visual and aesthetic resources;

- Describe the potential impact on the tourism industry from the Project's development which may impair the wilderness experience of tourism in the Project region; and,
- Describe the potential impacts to the Iqalugaarjuup Nunaaga Territorial Park in terms of recreational activities. Discuss the capacity required to support any increase in recreation activities associated the development of the Project and specifically, development of Phase 2 of the all-weather access road.

8.2.9 Cultural, Archaeological and Palaeontological Resources

8.2.9.1 Baseline Information

- Summary description of known archaeological/paleontological, burial, cultural and historic, sacred and spiritual sites within the LSA, based on TK and scientific baseline studies. Each site shall be described on a map with a corresponding scale. Large scale maps should be sent to the Government of Nunavut, Department of Culture, Language, Elders and Youth (GN-CLEY) upon request, to assist in its review. The GN-CLEY is responsible for archaeological and palaeontological sites and the keeper of archaeological and palaeontological data and material;
- Description of regulatory requirements and procedures for recovery and removal of artefacts and/or fossils in areas of proposed development;
- Description of the relationship between the cultural sites and social lives of local communities in the LSA; and,
- Description of the natural and cultural heritage associated with the Meliadine River and a discussion of its importance to Inuit.

8.2.9.2 Impact Assessment

- Potential impacts to archaeological and paleontological resources (e.g., burial sites, sacred sites), and other cultural sites within the LSA from development of the Project infrastructure in particular the proximity to the all-weather road, each of the mine sites and associated haul roads;
- Potential impacts on paleontological/archaeological resources from increased Project activity in the area associated with the mine including ground and marine transportation and ongoing exploration as well as non-mine related activities;
- Potential impacts to archaeological resources as a result of borrow pit and quarry construction and operation, as well as construction and use of access roads. Discussion of how considerations for potential impacts have been incorporated in the road routing and design should also be presented;
- Potential impacts on cultural well-being, religious and spiritual activities which are related to cultural and historic, sacred and spiritual sites; and,
- Identify the potential effects to both the natural and cultural heritage values and how these values will be protected. Include a discussion on how the Iqalugaarjuup Nunanga Territorial Park's Management Plan will be met.

8.2.10 Individual and Community Wellness

For the purpose of the current Guidelines, discussions relating to individual and community wellness shall include family and community cohesion.

8.2.10.1 Baseline Information

- Description of the current individual and family well-being including a discussion on households, family and community stability;
- Description of household social structures within the Project RSA, and where possible, the prevalent representative household social structure, including: the prevalent composition (family/kin-relations co-existing, generations in the household), the gender roles, the prevalent division of household labour based upon existing gender roles, the dominant consumption patterns, access to credit, and how resources are shared/divided within the household as well as how decisions are made in the household;
- Description of the current status of human health in the RSA, including mental, and psychological health and well-being and identify vulnerable sub-groups where applicable;
- Description of nutritional requirements of residents in the RSA along with quantitative information on the diet habits of residents, including consideration of details such as the seasonal, gender and age-related consumption of country foods;
- Description on the current issues related to substance abuse, crime and violence, and other relevant social factors;
- Overview of the current financial management programs available in the potentially affected communities; and,
- Description of the current community well-being, including information about the capacity, availability, and affordability, where relevant, of local services and infrastructure (i.e. housing, training, education, day care services, health care, etc.).

8.2.10.2 Impact Assessment

- Description of potential impacts to individual and family well-being from the Project;
- Potential impacts to household social structure from the Project (e.g., one or two family members working at the mine site);
- Potential effects on lifestyle, including the effects of a major employment base away from the communities;
- Potential effects on community and family stabilities, and culture integrity due to the demographic changes;
- Potential impacts on human health and well-being within the RSA resulting from potential indirect effects of the Project. This discussion should give consideration to substance abuse, family violence, sexually transmitted infections, other communicable diseases and gambling;
- Potential impacts on human health associated with traditional lifestyles where large amounts of country foods are consumed, considering the bioaccumulation and take-up of contaminants associated with changes to the level of contaminants loadings in country foods (*i.e.*, wildlife and vegetation consumed by humans);

- Description of increased pressure on existing social, institutional, and community services, facilities and services, and infrastructure;
- Potential impacts to community well-being in the RSA;
- Potential impacts to community safety and security with consideration for a potential influx of Project personnel into local communities during the life of the Project; and,
- Description of barriers to current financial management programs and any incentives that would be provided by the Proponent for healthy financial management.

8.2.11 Community Infrastructure and Public Services

8.2.11.1 Baseline Information

- Description of current conditions of local supply and demand of housing and other infrastructure, and capacity in the RSA;
- Description of existing public services and associated community facilities in the RSA, including law enforcement, health care, emergency response, dependency assistance, welfare utilities, temporary accommodation and food services;
- Description of existing outpost camps and other facilities outside of municipal boundaries which facilitate harvesting and recreation activities in the LSA, particularly within the proximity of the Project;
- Description of the extent and current capacity of the local transportation systems and associated infrastructure; and,
- Discussion of demand for community infrastructure and public services from the Project directly and indirectly.

8.2.11.2 Impact Assessment

- Assessment of incremental costs imposed by the needs from the Project directly or indirectly on public infrastructure and services;
- Evaluation of the effect on services and/or infrastructure in public and private sectors, due to the potential use by the Project directly or indirectly;
- Assessment of public health and environmental health needs and implications to the Proponent's community initiatives;
- An assessment of potential increased demand on the local and regional health care systems, including the standard medical system, emergency response and emergency medical care, medevac services, and challenges raised by any increased demand;
- A discussion of the potential to bring in freight for communities by return shipping, and likelihood to share shipping costs with local communities;
- Discussion of building new and updating existing structures including weather shields and outposts beyond the boundary of communities and along hunting/traveling routes, and/or at hunting grounds which may facilitate local hunting activities/traveling in Project areas; and,
- A discussion of community access to Project infrastructure upon closure, including the all-weather road.

8.2.12 Governance and Leadership

8.2.12.1 Baseline Information

- A description of the current social and governmental regimes in the Project region, structure and functions of the governments, Inuit organizations, other co-management organizations and interactions among those organizations;
- A description of the Proponent's understanding on the roles that governments play in the process of the Project development, and associated requirements and obligations for proponents by policies and regulations;
- A description of the roles of the various parties in socio-economic monitoring programs and the Kivalliq Socio-Economic Monitoring Committee;
- An outline of GN policies regarding contracting, operation and management of community infrastructure, community and regional development planning; mechanism, processes and structures for conflict resolution; and,
- Other social and economic responsibilities of governments in the Project impacted regions.

8.2.12.2 Impact Assessment

- Discussion of how the Project planning meets the needs of regional economy development strategic plans (community wellness initiatives, Hamlet programs, housing etc.), if applicable, which are managed by Federal and territorial governments agencies, and Inuit organizations;
- Assessment of how potential conflict of interest will be managed in current governance regime during Project development; and,
- Discussion of efforts to be made by the Proponent within existing regulatory framework and government's initiatives, in terms of socio-economic monitoring, education and skill training, community facility development and other initiatives planned by the Proponent.

8.2.13 Health and Safety (including worker and public safety)

8.2.13.1 Baseline Information

- Description of human exposure to current environmental contaminants in the RSA;
- Description of the existing infrastructure and health services available within the RSA; and,
- Discussion relating to the local health statistics when compared with other parts of Nunavut and Canada as appropriate.

8.2.13.2 Impact Assessment

- Discussion of the standards, guidelines and regulations that the Project will incorporate during construction and operations, at various Project sites to minimize the impacts and protect workers' health;

- Assessment of the health, safety and security of workers at the job sites taking into account different Project phases and locations (e.g., explosive manufacturing plant, drilling and blasting operation, and heavy equipment operations);
- Potential impacts on human health from air contamination, fugitive dusts resulting from air and ground traffic, potential impacts to potable water quality, and exposure to escalated noise and extreme weather conditions;
- Potential sources and characteristics of any conventional risks to workers or the public during all phases of the project; and,
- Potential impacts of workplace discipline and cultural conflicts among Nunavummiut and Southern workers.

8.3 HUMAN HEALTH AND ENVIRONMENTAL RISK ASSESSMENT

Key components of the Human Health Risk Assessment process include the identification of potential project-human interactions (pathways), and hazardous substance constituents of potential concern (COPC), human receptors and assessment criteria. As such, 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 COPCs;
- Identification of pathways to human receptors;
- Identification and characterization of human receptors (workers and the public). Include 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; specifically, calculation of hazard quotients, which translates into the ratio between the predicted maximum exposure concentration for each contaminant of concern in each relevant media (i.e., air, water, soil, sediment) and the toxicity threshold for the most sensitive biological receptor in the respective medium for which toxicity information is available.

Key components of the Environmental Risk Assessment process include the identification of potential project and terrestrial and aquatic receptor interactions (pathways), hazardous substance COPCs, terrestrial and aquatic ecological receptors and assessment criteria. As such, 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).

8.4 ACCIDENT AND MALFUNCTIONS ASSESSMENT

An assessment must be provided for malfunction and accident scenarios that have a reasonable probability of occurring. The assessment is to include:

- 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 malfunctions and accidents; and,
- A description of any contingency, clean-up or restoration work in the surrounding environment that would be required during, or immediately following, the postulated malfunction and accident scenarios.

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

9.0 ENVIRONMENTAL MANAGEMENT SYSTEM

9.1 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) provides a systematic approach to consistently manage 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 its environmental performance by continual improvement of the management system. The Proponent shall present its environmental policy, its EMP and associated environmental management system through which it will deliver this plan. The EMP shall provide a perspective on how potentially adverse environmental effects will be managed throughout the life of the Project.

The Proponent shall discuss the flexibility of the proposed EMP to respond to changes in the mining development plan, the regulatory regime, the biophysical and socio-economic environments, technology, research results, and the understanding of TK. It shall discuss how the results from the EMP will be used in applying 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 may be dependent on the Proponent's development plans for the project, which will continue to be refined throughout the NIRB's review process. While some

information required under these plans might not be available for the Proponent's *Draft* 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.

9.2 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 construction for all phases of the Project [(site preparation, construction, operation, maintenance, any potential modifications, temporary closure, final closure (decommission & reclamation) and post-closure]. The EPP shall be integrated into procedure documents for all phases of the Project which 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. A Table of Contents and an annotated outline for the EPP is to be presented in the EIS which shall address the major Project activities, permit requirements, mitigation measures and contingency planning in combination with other management plans.

9.3 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, 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.

These plans will also help the Proponent to ensure that the Project is conducted as proposed, the predicted adverse environmental effects are promptly mitigated at the earliest possible time, and that the conditions set at the time of the Project's authorization and the requirements pertaining to the relevant laws and regulations are met. The plans will also make it possible to ensure the proper operation of works, equipment, and facilities connected to the Project. If necessary, the plans will help reorient the work and possibly make improvements at the time of construction and implementation of the various elements of the Project.

In its monitoring and mitigation plans, the Proponent should specify proposed criteria or thresholds to trigger the mitigation measures based on its monitoring results, including the position of the person for the implementation of these mitigation measures, the system of

accountability and the phase and component of the Project to which the mitigation measure would be applied.

Each of the monitoring and mitigation plans shall include:

- Objectives of the monitoring program, applicable laws, regulations and/or Acts;
- The VECs and VSECs to be monitored, with associated parameters and indicators, and selection criteria/thresholds to be compliant with;
- 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 7.3](#), 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. This would improve interpretation of monitoring data in order to differentiate between natural variability and project-specific impacts.

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.

9.4 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 as identified in [Section 8.1](#). The Proponent shall also identify any residual effects after appropriate mitigation measures are 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. The plans

shall target identified VECs and shall include but are not limited to the following individual plans:

9.4.1 Risk Management and Emergency Response Plan

The Proponent should provide an assessment of the potential risks from natural hazards, in both marine and terrestrial environments. This plan should encompass the whole life of the mine to mitigate the potential ecological and human health risks. The Proponent should identify and describe the likelihood of possible malfunctions and accidents occurring independently of, or associated with natural hazards.

The Proponent shall develop an Emergency Response Plan, supported by appropriate manual emergency response capabilities, that can be applied to deal with the range of emergency situations considered reasonable in the circumstances.

The following issues should be included in the Risk Management and Emergency Response Plan:

- Assessment of potential natural hazards in the LSA and shipping corridors, including frequency, magnitude and possibilities of occurrence. Natural hazards to be considered should include extreme weather events, natural seismic events, landslides, and flooding;
- Analysis of the potential for malfunctions and accidents associated with Project facilities and activities, including land or ice based, air or marine transportation, occurring independent of, or associated with natural hazards;
- Sensitivity analysis of the Rankin Inlet area, including an evaluation of the probability of accidents and malfunctions that may be unlikely but would be of significant impact (e.g., major fuel spills, etc.) to the environment, Nipisar Lake and/or any other potential municipal water sources, and to Rankin Inlet. Include a description of contingency plans, mitigation measures and identification of alternate community drinking water sources;
- 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 restriction for the Project area;
- Assessment of fire risk to evaluate potential fire hazards, as well as the fire protection systems and features (including both physical attributes and program elements) used to mitigate the effects of fire;
- Alerting, notification and reporting procedures, and associated responsible organizations and personnel;
- Contingency responding procedures corresponding to each risk, and associated security systems and prevention measures, such as monitoring systems, hazard and leak detection systems, fire-control systems, and standby emergency systems;
- Discussion of options for the medical transport of injured staff or persons both within and beyond the Project area;
- Discussion of the constraints resulting from logistics and time frames for prompt reaction, with consideration for the potential distance to an accident or emergency site, and possible weather conditions which might cause considerable delays or obstacles;

- Description of how relevant government agencies, Inuit organizations and local communities will be involved in the development of the plans if applicable; and,
- Any other contemplated loss prevention practices, including insurance.

9.4.2 Fuel Management Plan

The Proponent shall develop Fuel Management Plans based on its Environmental Policy, to promote environmental awareness and safety. The plans should be linked to spill contingency plans.

- Requirements of federal and territorial regulations;
- Substances covered by the plan (e.g., oil, fuel, hazardous materials, chemicals and other deleterious substances);
- Training for emergency response staff, including distributing Material Safety Data Sheets (MSDS) to designated emergency response and health centre staff;
- Alerting, notification and reporting procedures; and
- Duties and responsibilities of key organizations and personnel.

9.4.3 Spill Contingency Plans

The Proponent shall develop Spill Contingency Plans based on its Environmental Policy, to promote environmental awareness and safety, as well as to facilitate efficient clean-up for potential spill incidents related to the Project. These plans should include Land, Water and Ice Based Spill Contingency Plans, Oil Handling Facility Contingency Plan and Shipboard Oil Pollution Emergency Plans. In each plan, the Proponent should address potential constraints due to logistics and weather conditions for timely actions and immediate clean-ups. When developing these plans, the following elements should be included:

a. Land, Water and Ice Based Spill Contingency Plans

- Requirements of federal and territorial regulations;
- Substances covered by the plan (e.g., oil, fuel, hazardous materials, chemicals and other deleterious substances), and potential spill scenarios (on land, water and ice, if applicable);
- Training for emergency response staff, including distributing Material Safety Data Sheets (MSDS) to designated emergency response and health centre staff;
- Alerting, notification and reporting procedures;
- Duties and responsibilities of key spill response organizations and personnel;
- Clean-up strategies, technologies and corresponding inventory of spill response equipment and kits based on different substances of spills and environment conditions where spills might occur; and,
- Spill site restoration and remediation.

b. Oil Handling Facility (OHF) Contingency Plan

- Regulatory requirements of the *Canada Shipping Act*;
 - Established Oil Pollution Prevention/Emergency Plan for operation of OHF;
 - Responsible personnel required equipment and training; and,
 - Response scenarios and procedures.
- c. Shipboard Oil Pollution Emergency Plans (SOPEPs)
- Requirements of national laws and regulations, as well as international regulations and standards for proposed shipping operation of the Project;
 - Marine transportation to be used for the Project including fuel tankers, container ships, barges, tugs, and any other marine vessels;
 - Discussion regarding the relationship between SOPEPs and the Canadian Coast Guard's Regional Response Plan, including identification of potential for the Regional Response Plan to be adapted to the Project;
 - Procedures for accident/incident reporting and principle emergency response; and,
 - Parties (e.g., the Proponent, marine vessel operators and possible third parties) who carry out emergency actions.

9.4.4 Site Water Management Plan

The Proponent shall develop a Site Water Management Plan for the Project. This Plan should 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. This plan should include discussion on all major sources of water from the Project including process effluent, open pit water, underground mine water, site and stockpile drainage/runoff, and sewage/grey waste water and should be associated with the baseline data and impact assessment required by [Subsection 8.1.6](#). The plan should consider the following:

- Surface runoff, snowmelt, and rainwater that might come in contact with contaminated areas at the mine sites, along the access road and at Rankin Inlet;
- Runoff from overburden stockpiles, waste rock stockpile areas including waste rock identified with potential ARD and ML, ore stockpiles and quarry sites;
- Runoff from the lined fuel tank farms, fuel transfer stations, and landfill facilities;
- Predict the artesian inflow into the tailing management facilities during operation with support from numerical modeling if permafrost beneath the tailing management facilities is predicted to thaw during the life cycle of the tailing management facilities. The potential preferential flow along the fault cut through the pits should be considered in the inflow prediction. Measures for controlling the groundwater inflow/seepage, where necessary, should be discussed and a groundwater monitoring plan should be developed;
- Description of the water management strategies, including methods for any water conservation and recycling methods to maximize water reuse and minimize use of natural waters;
- Description of the water management for the open pits and underground mines, and the tailings management facilities with consideration for the capacity of the open pits and underground mines, and the tailings management facilities to cope with storms, floods and other intermittent natural events with consideration of a conservative precipitation

event (*i.e.*, the PMP: Probable Maximum Precipitation). Design of the pumping capacity of the plant and treatment facility should take the potential maximum inflow and the PMP event into consideration;

- Contingency plans should the mine water volumes be significantly larger than estimated;
- Management measures to reduce potential impacts to the receiving environment, including collection and monitoring of drainage water, installation of settling ponds/sumps and/or silt curtains, and geochemical characterization of construction materials;
- Proposed management of contact and noncontact water, and how the design of these components incorporates the consideration of climate change, especially when water diversions are proposed (*i.e.*, increased or decreased flows);
- Waste water treatment technologies and facilities, and estimated volumes and treatment targets of the effluent, as well as the applicable discharge standards including standards under the *Fisheries Act*;
- Waste water management in the construction stage at construction camps, including treatment/disposal methods, associated facilities;
- Conceptual operation and maintenance plans, including options for sewage sludge; and,
- Contingency measures for sewage plant malfunction and/or disturbances, associated spill response measures, as well as treatment technologies and facilities.

9.4.5 Ore Storage Management Plan

The Proponent shall present an Ore Storage Management Plan which should encompass all ore generated or produced by the Project and include:

- Discussion of the predicted ore stockpile volumes/tonnage, physiochemical characteristics, stockpile methods and procedures including dust control, runoff management, progressive reclamation plans, and other details as deemed relevant;
- Description of analyses implemented in the development of the proposed pile design and runoff management plans, include description and analysis of the water balance of the stockpiled ore material; the physical and chemical characteristics of seepage and runoff from the stockpiled ore material, as well as the thermal condition of the pile and surrounding ground; and consideration in the design of control measures to ensure seepage and runoffs do not impact the surrounding environment;
- Discuss the means to minimize loss of ore material to the environment by wind and other means;
- Discussion of proposed plans for accommodating the projected volumes of materials at the ore stockpile facilities; with a discussion of measures for contingency situation in which the designed facilities are not adequate to accommodate ore actually generated;
- Details regarding the process for selecting the preferred options for management of ore stockpile, including a discussion of alternative options (methodologies as well as locations) considered, and the rationale by which the proposed scheme was selected; and,
- Conceptual plan to monitor and audit ore generated.

9.4.6 Waste Rock Management Plan

The Proponent shall present a Waste Rock Management Plan which should encompass all wastes generated or produced by the Project through all Project phases and should include:

- Discussion of the predicted volumes/tonnage of waste rock, physicochemical characteristics, segregation criteria, stockpile methods and procedures including dust control, runoff and seepage management, progressive reclamation plans, and other details as deemed relevant;
- Description of analyses implemented in the development of the proposed pile design and runoff and seepage management plans, include description and analysis of the water balance of the waste rock pile; the physical and chemical characteristics of seepage and runoff from waste rock piles, as well as the thermal condition of the pile and surrounding ground; and consideration in the design of control measures to ensure seepage and runoffs do not impact the surrounding environment;
- Description of the potential for rock heave phenomena and any resulting implications to ground stability;
- Discussion of proposed plans for accommodating the projected volumes of materials at waste rock facilities; with a discussion of measures for contingency situation in which the designed facility is not adequate to accommodate waste rock actually generated;
- Details regarding the process for selecting the preferred options for management of waste rock, including a discussion of alternative options (methodologies as well as locations) considered, and the rationale by which the proposed scheme was selected; and,
- Conceptual plan to monitor and audit mine waste rock.

9.4.7 Landfill Management Plan

The Proponent shall develop a Landfill Management Plan which discusses how non-combustible, non-hazardous industrial wastes will be handled in a safe and environmentally sound manner. This plan should include:

- Management plans for operations;
- Rainwater, snow and spring freshet management plans; and,
- Final reclamation plans.

9.4.8 Hazardous Materials Management Plan

The Proponent shall develop a Hazardous Materials Management Plan. The hazardous materials discussed should include hydrocarbon contaminated soils, snow and water, fuel, lubricants, process reagents, chemical reagents used for site laboratory, solvents and paints, medical wastes, batteries, and other office-generated hazardous waste. This plan should be developed in connection with the Emergency Response and Contingency Plan, and include the following:

- Characterization of potential environmental hazards posed by these materials, and the management of these through the environmental management system;
- Purchasing controls, shipment tracking procedures;

- Fuel storage monitoring program;
- Safe handling and storage procedures;
- Discussion of the allocation of responsibilities for managing shipments, storage, handling and use of potentially hazardous materials;
- Contingency and emergency response plans associated with hazardous materials;
- 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., local fire department, health centre, Royal Mounted Police detachment, etc.);
- 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;
- Plans for unused chemicals and/or reagents upon the completion of Project activities;
- Procedures to track and manage wastes generated through use of these products, including regular shipments of potentially hazardous waste to licensed disposal facilities and,
- Discussion on the waste management at the dock site including shipping waste generated on board and hazardous waste.

9.4.9 Incineration Management Plan

The Proponent shall develop an Incineration Management Plan which is consistent with the guidance provided in the Environment Canada's (EC) *Technical Document for Batch Waste Incineration*. The Plan should include but not be limited to the following:

- Standards/requirements for emissions from incinerator operation;
- Incineration technologies to be used, facilities and equipment to be used;
- Personnel training programs for incinerator management and operation; and,
- Collection and reporting of operational data and maintenance records.

9.4.10 Roads Management Plan

The Proponent shall develop a Roads Management Plan for all access roads/service roads proposed in the Project areas, covering construction, operations, temporary closure and final closure (decommission & reclamation) phases of the Project. In association with the Spill Contingency Plan and the Wildlife Mitigation and Monitoring Plan, this plan shall include the following:

- Permitting regime and land tenure of all ground transportation (designations of accessibility to public);
- Discussion on how the selected route(s) may correspond to the needs of other developers and of Nunavummiut, paying particular mind to any public consultation undertaken with respect to the proposed routing, specifically as it may relate to traditional land or resource use;

- Discussion of plans for public access to Project ground transportation roads, including considerations relevant to design and traffic management, associated mitigation and safety measures;
- Projected traffic volumes, including the types and numbers of vehicles to be used, fluctuations on a seasonal or annual basis, and speed limits;
- Mitigation measures and protocols to be implemented during construction and operations to mitigate potential impacts to wildlife, including collisions and follow-up procedures;
- Measures for preventing the permafrost degradation during construction and operation of ground transportation;
- Operational procedures for daily operation and maintenance including dust suppression methods, snow removal, de-icing, snow drift/banks management;
- Measures to control surface runoff during spring freshet and flooding during construction and operation phases;
- Measures to control sedimentation during construction, maintenance and operation;
- Safety procedures, emergency reporting and procedures for fuel/chemical spills, and other emergency events;
- Plans for site reclamation, especially temporary construction camp and quarry sites which are used for extracting construction materials; disposal of construction waste materials and options of final closure and reclamation; and,
- A discussion of potential future uses (e.g., potential public use).

9.4.11 Shipping Management Plan

The Proponent shall present a Shipping Management Plan for all Project-related shipping, in connection with the SOPEPs ([Subsection 9.4.2](#)), the Wildlife Mitigation and Monitoring Plan, and other related plans as applicable. This plan should include the following:

- Applicable environmental legislation, regulations Acts and guidelines associated with shipping, including:
 - International legislation, such as: MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization ([IMO, 2008](#); [MARPOL 73/78](#))
 - Canadian legislation, such as: *Canada Shipping Act*, *Arctic Waters Pollution Prevention Act* (e.g., the Zone/Date System, the Arctic Ice Regime Shipping System, Ice Navigators if applicable)
 - How the Proponent and its shipping contractors/partners intend to either meet or exceed these requirements for both barging and deep sea shipping operations and for all marine shipping alternatives
- Description of basic contingency planning associated with the marine transportation component of the project, particularly in relation to the movement of oil, explosives and other hazardous materials;
- Provide a hazard identification analysis of the barge and ship routes and a preliminary risk analysis of the marine routes under consideration along with intended methods of mitigating marine transportation risks;

- Discussion of proposed safety measures;
- Disposal plans and management for onboard waste including solid waste and sewage/grey water while docked at the dock facility and while in transit. Plans should include discussion on how the Proponent and its shipping contractors/partners intend to either meet or exceed legislation and/or regulations requirements;
- Ballast water management plan for all Project shipping, with indication of the proposed ballast water exchange locations in mid-ocean, at the dock facility in Rankin Inlet, and alternative exchange zones within waters under Canadian jurisdiction. Include associated implications for regulatory compliance ([Government of Canada, 2006](#));
- Proposed measures to eliminate or reduce the risk of invasive aquatic and non-aquatic species being introduced into Canadian waters as a result of shipping;
- Discussion of whether the shipping route or part of the proposed shipping route is a compulsory or non-compulsory pilotage area, and associated implications for regulatory compliance ([Government of Canada, 2009](#)) if applicable;
- Marine wildlife mitigation and onboard monitoring plans, including:
 - Applicable guidelines, monitoring protocols, and reporting/action procedures
 - Measures to minimize the potential interactions between marine mammals and marine vessels
 - Description of how interactions between marine mammals and shipping operations will be dealt with
- Details regarding the proposed procedures for accident, malfunctions and incident management and reporting, including accidental spills of fuel and chemicals along the shipping routes, and from the accidental grounding/stranding of ships along the shipping routes. This should include a discussion of the preparedness of adequate resources to respond to a large fuel spill from a cargo vessel in transit, with reference to the SOPEPs;
- Measures to mitigate potential impacts to the safety of persons traveling boats along Project shipping routes;
- Smuggling prevention measures;
- Identified third party liabilities; and,
- Measures intended to mitigate potential socio-economic impacts as results of shipping.

9.4.12 Borrow Pits and Quarry Management Plan

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

- Regulations and guidelines to be complied with;
- A description of how the Proponent will minimize the overall impact on surrounding environments by maximizing the use of existing pits and quarry sites to the extent possible, to minimize the number of opened pits, and minimizing haul distances and surface disturbance;
- Sediment, dust and erosion prevention and control measures;
- Results of ARD/ML potential testing for quarried materials and pit walls, and associated mitigation measures;

- Aggregate extraction and quarry methods, with associated mitigation measures for potential impacts on the environment, including archaeological resources and wildlife;
- Proposed methods for handling ice, with plans to manage water released by the thawing of permafrost and ground ice; and,
- Progressive reclamation strategy and associated technologies.

9.4.13 Explosives Management Plan

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

- Applicable federal and territorial Regulations and Acts;
- Methods and procedures for the manufacture, transport, storage, handling, and use of explosives;
- Details on the manufacture and storage facilities for Ammonium Nitrate and Fuel Oil (ANFO), including:
 - Maximum quantity of explosives at each facility
 - Specified location (*i.e.*, detailed site plan), with distances to vulnerable features to demonstrate that safety distances required by the Explosives Regulatory Division of Natural Resources Canada have been considered and met
 - Details on any temporary explosives facilities
 - Liquid effluent disposal plans
- Best practices to minimise usage and loss rate;
- Safe handling and spill containment prevention methods;
- Evaluation of worst case scenarios (e.g., accidental explosion);
- Security measures to be implemented;
- Personnel training program; and,
- Internal audit and inspection.

9.4.14 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 [Subsection 8.1.1](#). This plan should include the following key elements:

- Description of proposed air quality monitoring and related adaptive management measures for emissions related to the Project as described in [Subsection 8.1.1.2](#), including thresholds for action and mitigation strategies;
- An emissions reduction strategy, through which the Proponent would employ appropriate technologies and operating practices, in an effort to minimize emissions of air contaminants from all Project facilities including , comply with approved criteria, and reduce production of GHGs and other emissions;

- A dust reduction plan which addresses the use of dust suppression agents, procedures and applicable guidelines for all Project areas where fugitive dust is a concern for air quality and human health;
- An incineration management plan, as described in [Subsection 9.4.9](#), describing how emissions will be minimized and the *Canada-wide Standards for Dioxins and Furans* and the *Canada-wide Standards for Mercury emissions* met; and,
- Procedures for reporting of project emissions and monitoring results.

9.4.15 Noise Abatement Plan

The Proponent shall develop a Noise Abatement Plan to provide information on monitoring and mitigating of noise impacts based on its impact assessment in [Subsection 8.1.2](#). This plan should discuss:

- Applicable standards, guidelines and regulations that will be incorporated to minimize and mitigate noise effects from the Project;
- An environmental noise follow-up monitoring program indicating location, duration, timing and type of noise monitoring to be conducted;
- Description of noise control methods based on the climatic conditions and available technologies to be employed should mitigation be required;
- Measures and technologies to be adopted in the design and manufacturing of Project infrastructure and facilities to reduce noise;
- Description of noise attenuation and minimization measures to be employed through choosing appropriate equipment, installation of noise silencing devices, scheduling of take-off and landing aircrafts, and blasting timing; and,
- Occupational related noise management programs.

9.4.16 Aquatic Effects Monitoring Plan

The Proponent shall develop an Aquatic Effects Monitoring Plan to provide information on monitoring, to address mitigation measures to be implemented to protect and minimize the impacts on aquatic system from any and all project activities occurring in or near and watercourses during construction, operation, temporary closure, final closure (decommission & reclamation), post-closure phases. This plan should include:

- Applicable standards, guidelines and regulations;
- Erosion and sediment control measures for works in or near waterbodies and watercourses;
- Measures to be applied to protect fish, aquatic biota, and the habitat of both during blasting in or near freshwater and marine environments;
- Description of the fish-out program proposed for the removal of fish from the lakes that are proposed to be dewatered during construction of the mine and the tailings impoundment area; and,
- Monitoring and reporting protocols as per the Environmental Effects Monitoring (EEM) program of the Metal Mining Effluent Regulations (MMER).

9.4.17 Wildlife Mitigation and Monitoring Plan

The Proponent shall develop a Wildlife Mitigation and Monitoring Plan in consultation with Government of Nunavut, Department of Environment, Fisheries and Oceans Canada (DFO), EC, and other relevant agencies or organizations. This plan should include appropriate mitigation and monitoring for selected terrestrial and marine species, with consideration for potential impacts identified in the relevant subsections of the EIS. This plan also should include the following:

- Description of the LSA and the RSA for wildlife mitigation and monitoring programs;
- Selection criteria and rationales for wildlife species selected for monitoring and mitigation programs;
- Description of how TK collected by the Proponent has been integrated into baseline data collection, impact predictions and significance determinations, and the development of mitigation and monitoring programs;
- Details regarding plans for involvement of local hunters in wildlife baseline studies and monitoring program if applicable, including the mechanisms and resources allocated for local participation;
- Plans for coordinating 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 from studies/survey activities;
- Discussion of how terrestrial wildlife surveys, particularly low elevation caribou surveys, and monitoring protocols (including data confidentiality) will be designed to mitigate potential impacts on terrestrial mammals, in particular caribou;
- Description of monitoring study design and field methods, including 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;
- Description of how indicators, sampling design, methodology and analysis will be appropriate and adequate to detect spatial and temporal project-related impacts on wildlife and provide statistically rigorous tests of impact predictions presented in the EIS;
- Measures to be applied to avoid or reduce the disturbance, harassment, injury or mortality of marine mammals due to shipping activities;
- Measures to be applied to avoid or reduce the disturbance, harassment, injury or mortality of terrestrial wildlife due to Project activities, including measures to prevent wildlife from entering pit areas and birds from landing on tailings impoundment area;
- Measures to minimize noise disturbance to wildlife and hunters/travellers when conducting aerial wildlife surveys;
- Procedures and structures designed to mitigate/manage potential impacts to wildlife and wildlife movement (e.g., caribou crossings and migration routes) during construction and operations;
- Plans to facilitate the safe passage of wildlife across the all-weather access road and associated mitigation measures to prevent collisions with wildlife;

- Plans and measures to avoid or reduce the potential for project activities to act as an attractant to wildlife species and to avoid and reduce injury, illness or mortality of wildlife (including intentional killing of wildlife by mine personnel to defend human life or property);
- Description of data analysis methods, triggers/thresholds for adaptive management plans, and proposed mitigation measures;
- Mechanism for the evaluation of effectiveness of mitigation measures;
- Quality assurance and quality control measures; and,
- Reporting and plan updating procedures.

9.4.18 No Net Loss Plan

The Proponent shall present a No Net Loss Plan (NNLP) to discuss measures to be implemented for compensation of the loss of aquatic habitat. This plan should include the principle of No Net Loss for fish habitat, policies for the management of fish habitat ([DFO, 1991](#)), habitat replacement options where appropriate, monitoring programs and compensation plans developed in consultation with DFO and KIA. This plan should discuss the following:

- Requirements of related DFO policies;
- The estimate of total fish habitat loss and methods used for estimations;
- Compensation plans to achieve “No Net Loss” of fish habitat productive capacity;
- Procedures and structures designed to mitigate/manage potential impacts to fish and fish habitat during construction and operation including fishout programs of any drained lakes;
- Details regarding the monitoring plans for the offsetting measures; and,
- Details regarding the proposed compensation program, including locations and conceptual designs for implementation (e.g., rearing habitat, migration channels, etc.).

9.5 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. The socio-economic environmental plans shall correspond to the socio-economic impacts assessment described in [Section 8.2](#) and 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.

In this section, the Proponent shall describe its socio-economic monitoring plans and mitigation programs, including how they will identify, react and mitigate potentially adverse socio-economic impacts and augment positive socio-economic impacts. In consultation with the Kivalliq 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.

The general areas that shall be considered by the Proponent’s socio-economic monitoring include human resources, occupational health and safety, community and public involvement,

implementation of benefits agreements (IIBA), and if applicable, development partnership agreements. The Proponent shall outline how the predominant regional language/dialect in the RSA will be incorporated into each respective plan. The management plans shall include, but are not limited to the following individual plans:

9.5.1 Occupational Health and Safety Plan

The Proponent shall present an Occupational Health and Safety Plan focusing on the following elements in conjunction with its Spill Contingency Plan, Risk Management Plan, Noise Abatement Plan, and any other relevant plans:

- An overview of the occupational health and safety program for the activities and works being proposed;
- Policies and guidelines regarding interaction with Nunavut's medical health system including the provision of relevant health and safety information regarding hazardous materials to the appropriate health centers;
- Best safety practices and safety awareness programs;
- Employee involvement and related training programs for ensuring awareness of employee responsibilities in environmental and health and safety management, including roles pertaining to safety orientation, hazard analysis, first-aid training, human-wildlife encounters and protocols to follow, etc.;
- Risk management and safety management details regarding the preparedness of mine safety equipment and devices;
- Procedures for emergency incidence reporting and actions;
- Details regarding workplace monitoring and control; and,
- First aid training and occupational medical surveillance.

9.5.2 Community Involvement Plan

The Proponent shall present a Community Involvement Plan which discusses the following:

- Mechanisms for providing 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, etc.);
- Methods and procedures for establishing effective two-way communications for collecting and addressing public concerns;
- Methods by which to evaluate public engagement efforts in order to identify the effectiveness of the plan;
- Measures to assist communities with addressing potential social needs and problems related to the Project, including proposed counselling services for employees and their families regarding matters such as substance abuse, work-related stress management, family support, etc.;
- Approach to promoting the participation of Nunavummiut in project employment, including any preferential recruitment policies or practices;
- Plans for promoting local contracting opportunities and purchasing of local products (e.g., country foods);

- Discussion of how input from communities has influenced the design and implementation of monitoring plans and initiatives; and,
- Discussion of procedures for community-based monitoring of social, cultural, and ecological conditions to determine if, when, and how the Project contributes to community sustainable development.

9.5.3 Cultural and Heritage Resources Protection Plan

The Proponent shall present a Cultural and Heritage Resources Protection Plan which includes the following:

- Applicable regulations and guidelines for management of potential impacts to identified cultural and heritage resources;
- Discussion on how the heritage values of the Iqaluqaarjuup Nunanga Territorial Park, will be protected;
- Results of archaeological investigations and studies;
- Inventory of known archaeological resources in Project areas;
- Discussion of how the results from the Proponent's impact assessment have been considered and incorporated into the plan; and,
- General and site-specific measures for the protection of archaeological sites and mitigation of potential adverse impacts.

9.5.4 Human Resources Plan

The Proponent shall develop a Human Resource Plan. This plan should include the following:

- Applicable human resources legislation and the Proponent's policies regarding compensation and benefit programs (e.g., health care plan, insurance, vacation/maternity leave, etc.);
- Recruitment strategies with communities that includes regular information updates regarding employment/training opportunities, hiring plans and time schedules, etc.;
- Include a strategy discussing how to overcome potential entry barriers, education and training programs both for Project specific and universally applicable skills (e.g., partnerships with local schools and other educational institutions, on-the-job learning, and apprenticeships);
- Education and Orientation Plan to assist employees to understand their responsibilities in environmental protection and health and safety management;
- Worker rotation and pay schedules, health and safety programs, preferential recruitment policy, gender equality, skills and entry requirements, training and career development;
- Discussion of how the planned work schedules that are adapted to traditional activities, whether the Proponent will provide no-cost commuting to allow workers to continue to live in their own communities and to participate in their traditional economic and cultural activities;
- Considerations of the following issues: on-site public safety and well-being; cross-cultural orientation; firearms control; sexual and gender harassment; alcohol and drugs control measures; and supply of country food to Inuit workers at the mine site;

- Recognition and management plans regarding the rights and needs of hunting activities and traveling through Project areas by the residents from adjacent communities;
- Strategies for communicating relevant information of IIBA terms and conditions to employees;
- Policies and regulations regarding hunting and fishing by non-Inuit employees, while respecting the rights and needs of Inuit employees to harvest and pursue traditional activities, with a discussion of how such policies or regulations were designed to manage potential impacts to fisheries or wildlife resources; and,
- Discussion of any proposed policies or regulations regarding the prohibition of recreational hunting, fishing and other related activities by employees at specific locations and timing in Project area.

9.6 MINE CLOSURE AND RECLAMATION PLAN

The Proponent shall develop a preliminary Mine Closure and Reclamation Plan for the Project which outlines how the various components set out in [Section 6.0](#) will be decommissioned, reclaimed and closed following mine closure. The plan can be preliminary with key issues addressed for the environmental assessment in the NIRB's review, and Nunavut Water Board (NWB) Type A water license application ([Appendix C](#)), with the following requirements:

- To ensure that issues associated with the effective closure and reclamation of all Project components are considered at the earliest possible stage in the mine development process, thereby influencing mine design to take into account environmental issues related to mine closure and reclamation.
- To establish goals and final land use objectives 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 requiring implementation of the Mine 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 after mine 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 on the long-term monitoring and maintenance that may be required once physical and chemical stability of reclaimed areas have been established;
- Discussion on reduction or elimination of environmental effects once the mine ceases operation;

- Discussion regarding re-establishing conditions that permit the land to return to a similar pre-mining land use;
- Considerations for ARD and/or ML potential of rocks and tailings, in association with related waste rock and tailings management strategies;
- Any considerations for the restoration of the natural aesthetics of the project; and,
- The Plan is considered to be a “living” document; the level of detail should undergo further revision to reflect the progress of the Project as well as changes in technology and/or standards or legislation. This plan should include the establishment of thresholds and identified adaptive management responses should such thresholds be reached. 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.

9.6.1 Care and Maintenance Plan

A preliminary Care & Maintenance Plan shall be developed for the Project in conjunction with the Mine Closure and Reclamation Plan which outlines how the various components set out in [Section 6.0](#) will be treated in the event of a temporary closure or un-timely closure of the project. The plan can be preliminary with key issues addressed for the environmental assessment in the NIRB’s review and should include a discussion on the items listed in [Section 9.6](#).

9.7 FOLLOW-UP AND ADAPTIVE MANAGEMENT PLANS

A follow-up plan is a formal, ongoing process to: verify the accuracy of the environmental impact predicted in the environmental assessment and permitting stage of the Project, and to determine the effectiveness of proposed mitigation measures. If either of these two steps identifies unusual and unforeseen adverse environmental effects, then the existing mitigation measures must be adjusted, or if necessary, an adaptive plan with new mitigation or compensation measures must be developed, in particular the areas where scientific uncertainty exists in the prediction of adverse effects. In order to offset the likelihood of mitigation failure and the potential severity of the consequences, the Proponent shall formulate a process through which the information related to effectiveness of mitigation measures is analyzed, and associated adaptive measures be employed in the environmental management system:

- 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 9.3](#), would be incorporated;
- The mechanisms, through which monitoring results will be analysed, and if necessary, adjusted mitigation measures or adaptive plan will be employed. In addition, how the effectiveness of the new mitigation measure 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,
- The plan shall include the quantitative triggers or thresholds that will indicate the need to alter or vary the management plan or mitigation measures.

9.8 SIGNIFICANCE OF RESIDUAL IMPACTS

After having established the mitigation measures, the EIS shall present the residual effects assessment of the Project on the components of the biophysical and human environments, so that the reader can clearly understand the real consequences of the Project, the degree of mitigation of the effects and which effects 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 various components of the environment, 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 7.14](#).

10.0 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 in the Kivalliq Region, this conclusion should clearly present the importance of the EIS findings to the NSA and Canada.

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 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 organisation.

12.0 LITERATURE CITED

- AANDC (Aboriginal Affairs and Northern Development Canada, formerly Indian and Northern Affairs Canada or INAC). 2011. Minister of Aboriginal Affairs and Northern Development's Decision for the Meliadine Project. September 14, 2011. Available at <http://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-AEM%20MELIADINE/2-REVIEW/01-SCREENING%20DECISION/>
- ACIA (Arctic Climate Impact Assessment). 2005. *Arctic Climate Impact Assessment*. Cambridge University Press, 1042p.
- AEM (Agnico-Eagle Mines Ltd.). September 2011. Revised *Meliadine Gold Project – Project Description*.
- Alcorn, J. B. 1989. *Process as Resource*. Advances in Economic Botany, 7, 63-77.
- Berkes, F. 1993. Traditional ecological knowledge in perspective. In: Inglis, J. (ed.), *Traditional Ecological Knowledge: Concepts and Cases* (pp. 1-9). Ottawa: Canadian Museum of Nature.
- Berkes F. 1999. *Sacred ecology. Traditional ecological knowledge and resource management*. Philadelphia, Taylor and Francis.
- Berkes F., Colding J. and C. Folke. 2000. *Rediscovery of traditional ecological knowledge as adaptive management*. Ecological Applications, 10(5), 1251-1262.
- Blaikie P. and H. C. Brookfield. 1987. Common property resources and degradation worldwide. In: Blaikie P. M. and H. C. Brookfield (Ed.) *London, Land degradation and Society* (pp. 186-196). Metheun, London.
- Canadian Oxford Dictionary*, 2nd ed., Oxford University Press, Katherine Barber (editor), Ontario, 2004.
- 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>.
- Colding J. 1998. Analysis of hunting options by the use of general food taboos. *Ecological Modelling*, 110, 5-17.
- Davis, A. and J. R. Wagner. 2003. Who Knows? On the Importance of Identifying “Experts” When Researching Local Ecological Knowledge. *Human Ecology*, 31(3), 463-489.
- DFO (Fisheries and Oceans Canada). 1991. *Policy for the Management of Fish Habitat*. Department of Fisheries and Oceans, Ottawa, Ontario: 32 pp.
- DIAND (Department of Indian and Northern Development). 1999. *Granular Resources Directory – Nunavut*. Ottawa, Ontario: 41 pp.
- 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.
- EC (Environment Canada). 2007. Canadian Climate Change Scenarios Network website: <http://www.cccsn.ca/index-e.html>.

EC (Environment Canada). 2008. Information on Greenhouse Gas Sources and Sinks. Available at http://www.ec.gc.ca/pdb/ghg/ghg_home_e.cfm.

EC (Environment Canada). 2008, Guidelines for the Assessment of Alternatives for Mine Waste Disposal. Available at <http://www.ec.gc.ca/pollution/C6A98427-6C71-4886-BB37-2B4D09F95D5E/Guidelines%20for%20Alternatives%20Assessments%202011-09-15%20-%20E%20-%20FINAL.pdf>

Gadgil M., Berkes F. and C. Folke. 1993. *Indigenous knowledge for biodiversity conservation*. Ambio, 22, 151-156.

Government of Canada and Tungavik Federation of Nunavut. 1993. *Agreement Between The Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*. Ottawa: Indian and Northern Affairs Canada. Available at <http://laws.justice.gc.ca/en/N-28.7/>.

Government of Canada. 1985. *Fisheries Act*. R.S. c. F-14. Online: Department of Justice Canada <http://laws.justice.gc.ca/en/ShowFullDoc/cs/F-14///en>.

Government of Canada. 1990. *Gasoline Regulations*. SOR. 15.31. Online: Department of Justice Canada. Available at <http://laws.justice.gc.ca/en/c-15.31/sor-90-247/68779.html>.

Government of Canada. 1991. *Contaminated Fuels Regulations*. SOR. Online: Environment Canada. Available at <http://www.ec.gc.ca/ceparegistry/Regulations/DetailReg.cfm?intReg=5>.

Government of Canada. 1996. *Oceans Act*. c. 31. Online: Department of Justice Canada Available at <http://laws.justice.gc.ca/en/O-2.4/>.

Government of Canada. 1997. *Benzene in Gasoline Regulations*. SOR. c 15.31. Online: Department of Justice Canada. Available at <http://laws.justice.gc.ca/en/C-15.31/SOR-97-493/index.html>.

Government of Canada. 1999a. CEPA (*Canadian Environmental Protection Act*). S.C. c. 33. Online: Department of Justice. Available at <http://laws.justice.gc.ca/en/C-15.31/>.

Government of Canada. 1999b. *Fuel Information Regulations, No. 1*. C.R.C. c. 407. Online: Department of Justice. Available at <http://laws.justice.gc.ca/en/showdoc/cr/C.R.C.-c.407//20090903/en>.

Government of Canada. 1999c. *Sulphur in Gasoline Regulations*. SOR. Online: Environment Canada. Available at <http://www.ec.gc.ca/CEPARegistry/Regulations/DetailReg.cfm?intReg=18>. Amendment to regulations in 2009. Online: Environment Canada Available at <http://www.ec.gc.ca/CEPARegistry/Regulations/DetailReg.cfm?intReg=18>.

Government of Canada. 2002a. CNMAC (*Canada National Marine Areas Conservation Act*). c. 18. Online: Department of Justice. Available at <http://laws.justice.gc.ca/en/C-7.3/index.html>.

Government of Canada. 2002b. *Sulphur in Diesel Fuel Regulations*. SOR-254. Online: Department of Justice. Available at <http://laws.justice.gc.ca/en/showtdm/cr/SOR-2002-254//20070108>.

- Government of Canada. 2006. BWCMR (*Ballast Water Control and Management Regulations*). SOR. Online: Department of Justice. Available at <http://laws.justice.gc.ca/en/SOR-2006-129/>.
- Government of Canada. 2009. APAR (*Atlantic Pilotage Authority Regulations*). C.R.C. c. 1264. Pilotage Act. Online: Department of Justice Canada <http://laws.justice.gc.ca/en/C.R.C.-c.1264/>.
- Gregorich, E.G., Turchenek, L.W., Carter, M.R., and Angers, D.A. 2001. *Soil and Environmental Science Dictionary*. CRC Press, Boca Raton, Florida.
- 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.
- Health Canada. 2010. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment. (2010). *Guidelines for Canadian Drinking Water Quality – Summary Table*. Ottawa, Ontario. Health Canada. Available at: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2010-sum_guide-res_recom/index-eng.php. Accessed April 2011.
- IPCC (Intergovernmental Panel on Climate Change). 2007. IPCC Fourth Assessment Report: *Climate Change*, 2007 (AR4). Available at http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml. Accessed April 2011.
- IMO (International Maritime Organisation). 2008. Series, annexes, conventions and protocols set out by the International Maritime Organization. Available at <http://www.imo.org/>. Accessed June 2009.
- INAC (Indian and Northern Affairs Canada, now AANDC). 2005. *Glossary of Water Management Terms*. Indian and Northern Affairs Canada and the Nunavut Water Board; Iqaluit, Nunavut: 20 pp.
- INAC (Indian and Northern Affairs Canada, now AANDC). 2007a. *Glossary of Mining Terminology*. Minister of Indian Affairs and Northern Development and Federal Interlocutor for Métis and Non-Status Indians; Ottawa, Ontario: 25 pp.
- INAC (Indian and Northern Affairs Canada, AANDC). 2007b. *NWT Mining-related & Environmental Management Glossary*. Minister of Indian Affairs and Northern Development and Federal Interlocutor for Métis and Non-Status Indians; Ottawa, Ontario: 24 pp.
- Itarnisaliirijiit Katimajit. 1996. Conference on Sacred Sites and Spiritual Places, Rankin Inlet, 1996. Availability unknown.
- Johannes, R. E. 1998. The case for data-less marine resource management: examples from tropical nearshore fisheries. *Trends in Ecology and Evolution*, 13, 243-246.
- MARPOL. 1978. MARPOL Convention: The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL).

- McGoodwin J. R. 1990. *Crisis in the world's fisheries: people, problems and policies*. Stanford University Press, Palo Alto, CA.
- Meadows D. H., Meadows D. L. and J. Randers. 1992. *Beyond the limits: Confronting global collapse, envisioning a sustainable future*. Chelsea Green Publishing, Mills, VT.
- 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). 2008. *Guide 5: Guide to the NIRB Review Process*. Cambridge Bay, NU: NIRB.
- NPC (Nunavut Planning Commission). 2000. Keewatin Regional Land Use Plan.
- QIA (Qikiqtani Inuit Association). 2009. Comments on the Draft Environmental Impact Statement Guidelines for the Review of the Proposed Mary River Project. 8p.
- Schmink M., Redford K. H. and C. Padoch. 1992. Traditional peoples and the biosphere: framing the issues and defining the terms. In: K. H. Redford and C. Padoch (Eds). *Conservation of neotropical forests: working from traditional resource use* (pp 3-13). Columbia University Press, New York, New York, USA.
- Stevenson, M. G. 1996. *Indigenous knowledge in environmental assessment*. *Arctic*, 49(3), 278-291.
- Theodore L. and J. Reynolds and K. Morris (eds.). 1997. *Concise Dictionary of Environmental Terms*. Overseas Publishers Association, Amsterdam: 383 pp.
- Tilleman W. 2005. *The Dictionary of Environmental Law and Science*. 2nd ed. Environmental Law Centre, AB: 437 pp.
- UN (United Nations). 1972. Rio declaration on environment and development. In: *Report of the United Nations Conference on the Human Environment*, Stockholm; pp. 5-16.
- 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.
- UN (United Nations). 1991. *Convention on environmental impact assessment in a transboundary context*. Finland. 25 February 1991.
- 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.
- WCED (World Commission on Environment and Development). 1987. *Our common future*. Oxford University Press, Oxford.

- Wetzel, R.G. 2001. *Limnology: Lake and River Ecosystems*. 3rd ed. Academic Press, San Diego. 2001, 1006 pp.
- Whitney, J.B.R. and V.W. Maclaren (ed.). 1985. A Framework for the Assessment of EIA Methodologies. *Environmental Impact Assessment: The Canadian Experience*. Toronto, Ontario. Institute for Environmental Studies, Environmental Monograph No. 5.

APPENDIX A

NUNAVUT IMPACT REVIEW BOARD'S 10 MINIMUM EIS REQUIREMENTS

The following are the minimum required elements for an Environmental Impact Statement required under a Part 5 Review:

1. Statement of Consultation Principles and Practices

The Proponent must conduct pre-Project consultations with locally affected persons. Where at all possible, information about the Project must be distributed, and comments collected with a view to resolving any differences. Discussions should include, but not be limited to, land uses, policies, resource uses, Archaeological areas, infrastructure, and terrain sensitivities. Aboriginal cultural concerns must be highlighted throughout. The Proponent shall explain where, how, why, and with whom it conducted public consultation, and shall demonstrate an understanding of the rights, interests, values, aspirations, and concerns of the potentially affected communities. All comments from the public must be summarized, documented, and presented in the EIS.

2. Definition of Project

A definition of the Project must include a discussion of any connected or subsequently related projects in order to reveal the primary purpose and better understand complex or multi-staged related proposals.

3. Statement of Project's Purpose

Based on the concepts of the Precautionary Principle and Sustainable Development, an EIS must contain a statement explaining the need for, and the purpose of the Project. Where further economic development is needed for a given area, the Board expects the deficiencies in the economic status quo to be stated.

4. Anticipated Impacts Analysis

A comprehensive impact assessment must be carried out which includes, but is not limited to, environmental effects that are likely to result from the Project in combination with other projects or activities that have been, or will be, carried out. Anticipated impacts include short and long-term, direct and indirect, positive and negative, cumulative, socio-economic, archaeological and cultural impacts. This element of the EIS must include a mitigation analysis that explains how the impacts could be avoided, minimized, cured, eliminated, or compensated.

5. Cumulative Effects Analysis (CEA)

Cumulative Effects must be analyzed for all Part 5 Reviews. A project proposal causes a Cumulative Effect if, when added to other projects in the region, or projects reasonably foreseeable in the region, will cause an additive effect. A comprehensive examination of all Cumulative Effects must be included in an EIS.

6. Significant Effects Analysis

The Board must be advised of the significant impacts of the Project. This should be based upon:

- a. the Project setting, taking into account the location's unique ecosystemic characteristics, and

- b. the severity of the impacts, taking into account, but not limited to public health, land use plans, protected areas, habitat, or species, public concern, etc.

Ultimately, the Board will decide which effects are significant and report to the Minister accordingly.

7. Project Alternatives

This requirement includes, but goes well beyond, alternative means of carrying out the Project that might be economically and technically feasible and the environmental effects of those alternative means. This assessment must include the “no-go” or “no-build” alternative, as well as 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. Environment Canada’s Guidelines for the Assessment of Alternatives for Mine Waste Disposal (September 2011) may also be used by the Proponent in their assessment.

8. Sustainability Analysis

The EIS must contain an analysis of the ability of renewable resources affected by the Project to sustain current and future generations in Nunavut and Canada.

9. Monitoring or Post-Project Analysis (PPA)

The purposes of a PPA are to:

- a. measure the relevant effects of projects on the ecosystemic and socio-economic environments of the Nunavut Settlement Area;
- b. determine whether and to what extent the land or resource use in question is carried out within the predetermined terms and conditions;
- c. provide the information base necessary for agencies to enforce terms and conditions of land or resource use approvals; and
- d. assess the accuracy of the predictions contained in the project impact statements.

10. Trans-Boundary Effects Analysis

Where relevant, an EIS must include an assessment of all significant adverse ecosystemic or socio-economic trans-boundary effects.

****It is important to note that Section 12.5.2(j) of the NLCA gives the NIRB the authority to add other requirements as deemed necessary. The NIRB will always review each project proposal on a case-by-case basis, including instructions from the Minister, and may add other requirements as per s. 12.5.2 and 12.5.5 of the NLCA.**

APPENDIX B

FINAL SCOPE LIST FOR THE NIRB'S ASSESSMENT OF THE MELIADINE GOLD MINE PROJECT

The scope of the NIRB's assessment of the Meliadine project proposal is based on the requirements of Sections 12.5.2 of the Nunavut Land Claims Agreement (NLCA), the NIRB's 10 Minimum EIS Requirements and the project proposal submitted by Agnico-Eagle Mines Ltd. (AEM or Proponent) on September 29, 2011.

The process of "scoping" intends to identify the possible range of impacts from a project, including the physical works and activities proposed, and the factors to be assessed (i.e., the ecosystemic and socio-economic factors and environments to be considered in assessing the effects of the project) in the context of spatial and temporal scales at various project stages including preconstruction, construction, operation, modification/maintenance, decommissioning, abandonment, reclamation and other undertakings. The NIRB will consult with the public and interested parties to identify Valued Ecosystem Components (VECs) and Valued Socio-Economic Components (VSECs) that should be addressed by the Proponent's Environmental Impact Statement.

In addition to its Meliadine Gold Mine Project Proposal, on September 29, 2011 AEM submitted an additional separate and stand-alone application for the construction and operation of a single lane all-weather road ("Phase 1") for consideration as a 12.10.2(b) exception to the NIRB's Review of the Meliadine project. Phase 1 is proposed to be used solely for the transportation of fuel and materials to the Meliadine site in support of the bulk sampling program that was previously screened by the NIRB per File No. 10EA018. The Phase 1 development of the road is therefore *not* included within the NIRB's *Draft* Scope of the Meliadine project. The NIRB has requested that interested parties provide comments regarding AEM's 12.10.2(b) exception application by November 21, 2011.

1) Project Description, including the purpose and need for the Project

The scope of the development under review includes the physical works and activities or undertakings that constitute the Meliadine project proposal as submitted to the NIRB by AEM on September 29, 2011. Temporal scope for the Project will include each stage of the project, including construction, operation, maintenance, temporary closure (care & maintenance), final closure (decommission & reclamation) and post-closure periods, planned exploration to be undertaken in conjunction with the Project.

Project Proposal Summary

The Meliadine Project is a proposed gold mining and milling operation located in the Kivalliq region, approximately 25 kilometres (km) northwest of Rankin Inlet. The mine and mill will process 8,500 tonnes of ore per day. The Project includes seven geographical areas: Tiriganiaq, Wolf, Wesmeg, F Zone, Pump, Discovery, and the community of Rankin Inlet.

The main base of operations is proposed at the Tiriganiaq deposit which would include open pit and underground mining, ore processing, power plant, warehousing, administration, personnel accommodation, and all associated facilities to support these activities. The final gold product would be transported off site via air to the Royal Canadian Mint.

AEM proposed development at five (5) other deposits: Wolf, Wesmeg, F Zone, Pump and Discovery throughout the life of the Project. Both open pit and underground mining are proposed for these deposits. Discovery is the only deposit that would have satellite fuel storage.

At Rankin Inlet, the existing Itivia dock is proposed to receive materials barged from Canada's eastern ports during the open water season. A fuel storage/tankfarm and laydown area would be constructed adjacent to the Rankin Inlet airport. This area would serve as a transfer and storage facility for materials and supplies (i.e., fuel, reagents, supplies etc.) en route to the Meliadine mine site. The existing Rankin Inlet Airport would be used to bring personnel from the south and any materials that cannot be barged. Materials brought in by air would be moved directly to site.

The proposed activities for Phase 2 of the all-weather road include an expansion of the road constructed in Phase 1 (if the NLCA 12.10.2(b) exception currently under consideration is granted) into a two lane road, open to the public. In addition, AEM proposes to construct an 9.4 kilometre spur road south of Meliadine Lake to the Discovery deposit.

The proposed operational mine life is ten (10) years, with a four (4) year pre-operational construction phase and a post-operational decommissioning period of approximately three (3) years. The potential development of additional deposits in the project area could extend the operating life of the Project. Progressive reclamation will be undertaken for land, water and equipment no longer needed for the Project as well as the continuous management of hazardous wastes and contaminated soil and water.

Project Components

a. Tiriganiaq/Main Mine site

Activities: The main base of the operations will be at the Tiriganiaq site, which will include overburden removal; open pit and underground mining; blasting; ore transportation; dewatering and diking of waterbodies; quarrying activities; ore processing; tailings disposal; warehousing; refuelling; power generation and heat recovery; administration; and personnel accommodations.

Facilities (during operation): open pit; ramp/portal and underground mine; explosives storage; waste rock pad; ore storage pads; haul roads; mill facility; water treatment facilities; water storage facility; wastewater (sewage) facilities; tailings management facilities; hazardous material handling and storage facility; solid waste landfill or incinerator; fuel storage; re-fuelling stations; warehouse; main maintenance shop; main administration complex; dry facilities; power plant; assay lab; waste management equipment; and accommodation complex.

b. Development of five other mineral deposits/mine sites (Wolf, Pump, Wesmeg, F Zone, and Discovery)

Activities: overburden removal; open pit and underground mining; blasting; quarrying activities; ore transportation; dewatering and diking of waterbodies (where required); and fuelling (where required).

Facilities (during operations): open pit mine; ramp/portal and underground mine; waste rock/overburden management areas; all-weather haul roads, satellite fuel area(s) where required; dikes and/or water diversion (where required); and water intake facilities.

c. Rankin Inlet Tank Farm and Storage Facility

Activities: construction of tank farm and laydown area; use of existing Itivia dock for unloading; transfer of fuel to tankfarm; storage of fuel; transfer of materials to laydown area; storage of materials in laydown area; trucking of materials to site.

Facilities (during operations): floating pipeline (when required), spud barge (when required); fuel storage tanks; storage facility; laydown area; and satellite administration office.

d. Road infrastructure connecting Rankin Inlet to the Meliadine area

Note: AEM has proposed a two-phase approach for an all-weather access road between Rankin Inlet and the Meliadine Mine site. Phase 1 is being considered as a separate application and therefore, Phase 2 is the only road component that will be considered within the scope of this project.

Activities: Construction of Phase 2 of the all-weather road; construction of a spur road from the all-weather road to the Discovery deposit in phases; quarrying activities; road maintenance; dust management; and traffic management.

Facilities (during operation): Three gates (two manned and one unmanned); quarries, and one emergency shelter.

e. Mobilization and Shipping

Activities: unloading of fuel, reagents and supplies barged; transfer of materials to laydown area.

Facilities (during operation): Spud barge to be installed when required.

f. Abandonment, Decommissioning and Reclamation

Activities: removal of infrastructure and equipment from site; reclamation of disturbed areas; and natural revegetation.

Facilities (during operation): select infrastructure and monitoring equipment.

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

The assessment of the potential for ecosystemic and socio-economic impacts caused by the proposed project components and activities in the above section and extending through all the Meliadine project phases should refer to the environmental and socio-economic factors listed below. The scope of potential impacts caused by the project components, activities, and undertakings to environmental and socio-economic factors shall take into account the appropriate temporal boundaries and spatial boundaries and is expected to draw upon relevant information from scientific sources and traditional knowledge.

- a) Air quality**
- 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) Geology (including geochemistry)**
- f) Hydrology (including water quantity) and hydrogeology**
- g) Groundwater and surface water quality**
- h) Sediment quality**
- 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*
- j) Vegetation**
- k) Terrestrial wildlife and wildlife habitat, including**
 - i. Representative terrestrial mammals that is caribou, caribou habitat, migration, and behaviour, muskoxen, wolverine, grizzly bears, polar bears, wolves and less conspicuous species that may be maximally exposed to contaminants
 - ii. Wildlife migration routes and crossings
- l) Birds and their 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 Species at Risk
 - iv. Marine habitat
- n) Marine Wildlife**
- o) Socio-Economic Factors, including**
 - i. Economic development and opportunities
 - ii. Employment
 - iii. Education and training

- iv. Contracting and business opportunities
- v. Benefits, royalties and taxation
- vi. Population demographics
- p) Traditional activity & knowledge** including
 - i. Harvesting
 - ii. Land use
 - iii. Food security
 - iv. Language
 - v. Cultural and commercial harvesting
- q) Non-traditional land use and resource use**
- r) Cultural, archaeological and palaeontological resources**
- s) Individual and community wellness, including family and community cohesion**
- t) Community infrastructure and public service**
- u) Governance and leadership**
- v) Health and safety** including worker and public safety
- w) Residual and Cumulative Effects**
- x) Transboundary Effects**

3) Anticipated Effects of the Environment on the Project

The scope of the assessment will include the potential anticipated effects of the arctic environment on the project throughout the project's life. The scope of factors will include:

- a) Climate and Meteorology
- b) Permafrost
- c) Geotechnical hazards (including slope movement, differential or thaw settlement, frost heave, and ice scour)
- d) Subsidence
- e) Flooding
- f) Unfavourable geological conditions

4) Steps which the proponent proposes to take including any contingency plans, to avoid and mitigate adverse impacts

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 and these plans should extend through all the project phases. These plans shall take into account the appropriate temporal boundaries and spatial boundaries and is expected to draw upon relevant information from scientific sources and traditional knowledge and should include, but not be limited to:

- a) Emergency response (including spill response)
- b) Hazardous materials management
- c) Accidents and malfunctions
- d) Regulatory Requirements
- e) Mitigation measures

5) 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 which 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
- h) Any non-confidential details from the Inuit Impact Benefits Agreement

6) Steps which the Proponent proposes to take to compensate interests adversely affected by the project

The scope of the assessment will include the steps which the Proponent proposes to take to compensate interests adversely affected by the project including all non-confidential Inuit Impact Benefit Agreement process and content details.

7) The monitoring programs proposed by the Proponent to identify and manage ecosystemic and socio-economic interests potentially affected by the project

The scope of the assessment will include any programs that will 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 secured or seeks to secure

The scope of the project under review will include 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 Meliadine project proposal.

Nunavut Planning Commission	Conformity Determination under the Keewatin Regional Land Use Plan
Nunavut Impact Review Board	Project Certificate
Nunavut Water Board	Type 'A' Water Licence
Aboriginal Affairs and Northern Development Canada	Class 'A' Land Use Permit, rights-of-ways, Mineral Lease
Kivalliq Inuit Association	Land Use Licences, leases, easements, rights-of-ways and various other permits
Fisheries and Oceans Canada	Under section 35(2) and Section 32 of the <i>Fisheries Act</i>
Transport Canada	Navigable Water Permit and Oil Pollution Prevention/Emergency Plan as per the <i>Canada Shipping Act</i>
Government of Nunavut-Community and Government Services	Quarry approval and Right-of-Way approval
Natural Resources Canada	Explosive Manufacturing Licence
Environment Canada	Schedule 2 Amendment to Metal Mining Effluent Regulations
Canadian Nuclear Safety Commission	Nuclear Substances & Radiation Devices Licence
Workers Safety & Compensation Commission	Explosive magazine Permit renewal
Government of Canada – Department of Culture, Language Elders & Youth	Class 2 Permit for Heritage Sites
Nunavut Research Institute	Socio-economic & Traditional Knowledge Research Licence

9) Options for implementing the Project

The scope of the assessment will include project alternatives including alternatives to individual components/activities, alternate timings and development options, as well as presenting the “no go” option as it pertains to the overall Project.

10) Any other relevant 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 mine design, operation, and tailings containment;
- b) Traditional knowledge;
- c) Statement of Consultation Principles and Practices;
- d) Significant Effects Analysis;
- e) Sustainability Analysis; and

- f) Interactions between Valued Ecosystem Components and Valued Socio-Economic Components.

APPENDIX C

NUNAVUT WATER BOARD INFORMATION REQUIREMENTS FOR TYPE A WATER LICENSE APPLICATION

The NWB will provide the generic Supplemental Information Guide (SIG) for Mine Development (MM3) to the NIRB for incorporation into the Draft EIS Guidelines as an appendix. This appendix will serve as instructions to the Proponent to aid in its development of a Draft Water License Application.

Note: The NIRB and NWB Detailed Coordinated Process Framework (September 2009) is available from the NIRB's FTP site at the following link: <http://ftp.nirb.ca/02-REVIEWS/NIRB%20NWB%20COORDINATION/>