Environmental Impact Statement
Terms of Reference

for the

Environmental Impact Review of the
Hamlet of Tuktoyaktuk, Town of Inuvik and GNWT – Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories Development Proposal

Date of Issue:

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1. Introduction

The Inuvialuit Final Agreement (IFA) establishes an environmental impact screening and review process, consisting of the Environmental Impact Screening Committee (EISC) and the Environmental Impact Review Board (EIRB or Review Board) which are responsible for environmental screening and environmental impact review respectively, of developments proposed in the Inuvialuit Settlement Region. Guidance on the roles and responsibilities of the Review Board are found in sections 8, 11, 12 and 13 of the Inuvialuit Final Agreement. Direction on how the environmental impact review will be conducted is found in the Environmental Impact Review Board Operating Procedures, dated February 5, 2004, which can be found on the Review Board's web site, www.eirb.ca .

On April 27, 2010 the EISC referred the *Town of Inuvik and the Government of the Northwest Territories (GNWT) - Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories Development Proposal* (development or development proposal) to the EIRB for environmental impact review. The objective of the review is to assess the potential environmental effects of the proposed development, and for the EIRB to recommend whether or not the development should proceed and, if it should, under what terms and conditions, including mitigative and remedial measures.

The development proposal is also subject to a Comprehensive Study under the *Canadian Environmental Assessment Act* (CEAA). Under the *Memorandum of Understanding between the Environmental Impact Review Board and the Minister of the Environment concerning Approvals for Substitution of Process* (MOU), the EIRB review process will substitute for the CEAA process, resulting in only one assessment process being completed. The Review Board will be conducting its review of the development proposal in accordance with the requirements of the IFA and the MOU**.** The review process will ensure the environmental impact review is conducted and completed in an efficient and expeditious manner, while allowing for the participation of the public during the review process and at the Public Hearings.

The EIRB maintains a Registry containing all information relevant to the EIRB and to the review. The EIRB On-line Registry (EOR) is accessible through the Review Board web site at www.eirb.ca . All information that is relevant to the review, and is not of a proprietary nature, that is received by the Review Board will be posted to the EOR and will be publically accessible.

1.1 Purpose

The Terms of Reference for the EIS provide the Developer with the guidance needed to complete an environmental impact review of the potential biophysical and human environment impacts that may occur as a result of the proposed development if it were allowed to proceed. The Terms of Reference meet the requirements of the Inuvialuit Final Agreement, and sub-sections 16 (1), (2) and (3) of the *Canadian Environmental Assessment Act,* as required for this environmental impact review.

The Review Panel, established by the EIRB to complete the review once a final EIS is accepted by the Review Board, will use the final EIS submitted by the Developer as the basis for completing the public technical assessment and Public Hearings on the development proposal. Based on the results of the public review process, and considering all of the evidence received and posted to the EOR (where this evidence has not been identified as being proprietary or confidential), the Review Panel will make its decision about the proposed development, and forward its recommendations to the Minister of the Environment and to the competent authorities.

1.2 Acronyms

The following acronyms are used throughout the Terms of Reference.

Abbreviation	*Definition*
CCME	Canadian Council of Ministers of the Environment
CCP	Community Conservation Plan
CEAA	*Canadian Environmental Assessment Act*
COPE	Committee for Original Peoples' Entitlement
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPP	Canada Pension Plan
EI	Employment Insurance
EIRB	Environmental Impact Review Board
EIS	Environmental Impact Statement
EISC	Environmental Impact Screening Committee
EOR	EIRB On-line Registry
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
GHG	Green House Gas
GNWT	Government of the Northwest Territories
HTC	Hunters and Trappers Committee
IBA	Impact and Benefit Agreement
IFA	Inuvialuit Final Agreement, as Amended April 2005
IGC	Inuvialuit Game Council
IHS	Inuvialuit Harvest Study
ISR	Inuvialuit Settlement Region
KCAC	Keeping-Clean-Areas-Clean
KM	Kilometre
m	metre
MOU	Memorandum of Understanding (between the Environmental Impact Review Board and the Minister of the Environment concerning Approvals for Substitution of Process)
NT	Northwest Territories
NWT	Northwest Territories
PM	Particulate Matter
PWC	Public Works Canada
ROW	Right-of-Way
SARA	*Species At Risk Act*
TBD	To Be Determined
TK	Traditional Knowledge
VC	Valued Components (referring to VECs and VSCs collectively)
VEC	Valued Ecosystem Component
VSC	Valued Socio-Economic Component (including cultural considerations)

1.3 Definitions

The following definitions provide guidance for the purposes of the environmental impact review process.

Term	Definition	Source
Actual Wildlife Harvest Loss	Provable loss or diminution of wildlife harvesting or damage to property used in harvesting wildlife.	IFA ss.13(2)
Cumulative Effects	A positive or negative change to the environment that is caused by a human action in combination with other past, present and reasonably foreseeable actions; and, a cumulative environmental effect on Inuvialuit harvesting as a change to wildlife and wildlife habitat, and present or future harvesting opportunities caused by a human action in combination with other past, present and reasonably foreseeable actions.	EIRB
Developer	A person, the government or any other legal entity owning, operating or causing to be operated any development in whole or in part in the Inuvialuit Settlement Region (ISR), and includes any co-contractant of such owner or operator. For greater certainty, "Developer" includes any Inuvialuit Developer.	IFA s.2
Development	(a) any commercial or industrial undertaking or venture, including support and transportation facilities related to the extraction of non-renewable resources from the Beaufort Sea, other than commercial wildlife harvesting; or (b) any government project, undertaking or construction whether federal, territorial, provincial, municipal, local or by any Crown agency or corporation, except government projects within the limits of Inuvialuit communities not directly affecting wildlife resources outside those limits and except government wildlife enhancement projects.	IFA s.2
Environment	Means the components of the Earth, and includes (a) land, water and air, including all layers of the atmosphere, (b) all organic and inorganic matter and living organisms, and (c) the interacting natural systems that include components referred to in paragraphs (*a*) and (*b*).	CEAA s.2
Environmental Effect	Means, in respect of a project, (a) any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*, (b) any effect of any change referred to in paragraph (*a*) on i. health and socio-economic conditions, ii. physical and cultural heritage, iii. the current use of lands and resources for traditional purposes by aboriginal persons, or iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or (c) any change to the project that may be caused by the environment, whether any such change or effect occurs within or outside Canada.	CEAA s.2
Follow-up Program	Means a program for (a) verifying the accuracy of the environmental assessment of a project, and (b) determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project.	CEAA s.2

Term	Definition	Source
Inuvialuit	Those people known as Inuvialuit, Inuit or Eskimo who are beneficiaries under [the Inuvialuit Final Agreement] by reason of the settlement of their claim to traditional use and occupancy of the land in the ISR and who are represented by the Committee for Original Peoples' Entitlement (COPE) and, where the context requires, includes the Inuvialuit Regional Corporation, the Inuvialuit Land Corporation, the Inuvialuit Development Corporation, the Inuvialuit Investment Corporation, the Inuvialuit community corporations and any other corporation, trust or organization controlled by the Inuvialuit that may be established by or pursuant to [the Inuvialuit Final Agreement]. Inuvialuit includes the Inuvialuit Game Council and the Hunters and Trappers Committees.	IFA s.2
Life of the Project	The planned length of time the development will be operational, as determined by the Developer in its Project Description.	EIRB
Mitigation	Means, in respect of a project, the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through re-placement, restoration, compensation or any other means.	CEAA s.2
Public	Means, "governmental authorities competent to authorize the development", "government departments and agencies", "Inuvialuit organizations" and "other parties to the review proceedings".	EIRB
Sustainable Development	Means, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."	Brundtland Commission[1]
Wildlife	Means all fauna in a wild state other than reindeer.	IFA s.2

For the purposes of these Terms of Reference, the following pairs of terms have the same meaning and may be used interchangeably in this document:

Term 1	Term 2
Development	Project
Developer	Proponent
Effect	Impact
Impact review	Environmental assessment or impact assessment

Please note that all references in this document to the IFA are to: "*The Inuvialuit Final Agreement, As Amended, Consolidated Version, April 2005".*

[1] *United Nations. 1987.* Report of the World Commission on Environment and Development." *General Assembly Resolution 42/187, 11 December 1987.*

2. Goals and Principles

The goals and principles of an environmental impact review are to ensure that the process has regard for the following:

- Protecting the environment from significant adverse impacts of proposed developments.
- Protecting the social, cultural and economic well-being of residents and communities.
- Preserving the cultural identity and values of aboriginal people within a changing northern society.
- Enabling aboriginal people to be equal and full participants in the development of the economy and society.

The following principles are to be applied throughout the Environmental Impact Statement (EIS) by the Developer.

2.1 Respect for and Use of Traditional Knowledge

The EIS must reflect the inclusion and consideration of Traditional Knowledge (TK) in the environmental assessment process. TK might be considered confidential, therefore the Developer must make suitable arrangements with the TK holders on how to access and/or use the information appropriately.

The term 'Traditional Knowledge' can be used to collectively refer to different types of information that can be provided by the Inuvialuit and used in environmental reviews

The first type of information, traditional land use information, is collected to build a picture of current and historic patterns of use, and to discover how a proposed project may affect that use. This information is needed to assess the potential effects of a proposed project on traditional use.

The second type of information, traditional environmental knowledge, refers to knowledge about the environment that is held by the Inuvialuit. Examples of traditional environmental knowledge include knowledge of animal movements and population trends, location of permafrost, changes in water and air quality, berry patches, and the reaction of animal species to different disturbances. In the context of environmental reviews, it may also include information about changes in community wellness, health and climate, the location and importance of heritage resource sites, and resource use. This knowledge, in addition to contributing to the assessment of effects to traditional land use, can be used in conjunction with Western science to improve the biophysical and socioeconomic assessments.

Some of the potential benefits of collecting and using TK in the environmental review process include the following:

- To increase the accuracy of environmental and socioeconomic baseline data.
- To improve confidence in predicted biophysical and socioeconomic impacts.
- To identify and propose more relevant mitigation strategies.
- To strengthen the success of follow-up and monitoring programs.
- To contribute to project design and final project definition.
- To allow improved decision-making at all phases of a proposed project.

The incorporation of TK in the environmental review process and in the project planning, construction, operation, and decommissioning and remediation phases also assists developers in their ability to meet regulatory requirements, avoid costly delays in project planning, and achieve a more acceptable development overall.

2.2 Involvement of Potentially Affected Communities and the Public

The EIS must reflect the involvement of potentially affected communities in the environmental review process.

The goal of project-specific consultation is for the meaningful participation of potentially affected communities in decision-making, particularly when project development is contemplated for their traditional lands and their communities. Effective consultation is key to the mutual understanding, cooperation, and partnerships that are essential to successful project development.

The benefits of an effective consultation process flow to both potentially-affected communities and developers:

- Potentially affected communities are provided with sufficient information and time to identify possible risks and benefits of development proposals.
- Developers gain a better understanding of the needs and interests of those most directly affected by their projects.

As such, the purpose of conducting public engagement and consultation before submitting a draft EIS to the EIRB is to:

- Allow the Developer an opportunity to discuss the proposed development with potentially affected Parties and the public.
- Address or resolve any concerns expressed about the proposed development.
- Identify impacts of the development and demonstrate how the negative impacts will be mitigated.
- Advise potentially affected Parties of the proposed development.
- Inform the competent authorities of the proposed development.
- Gather any local knowledge and TK that might be relevant to the development. This information is normally obtained by dealing with the Hunters and Trappers Committee (HTC) in each community.

2.3 Recognition of the Inuvialuit Final Agreement and Community Conservation Plans

The EIS must reflect recognition and incorporation of:

1. The guiding goals of the IFA.
2. The goals, values, and strategies of Community Conservation Plans (CCP) in the environmental assessment process.

2.3.1 Goals of the IFA

The guiding goals of the IFA are to:

- Preserve Inuvialuit cultural identity and values within a changing northern society.
- Enable Inuvialuit to be equal and meaningful participants in the northern and national economy and society.
- Protect and preserve the Arctic wildlife, environment and biological productivity.

The EIRB will use these goals as overall guidance in the conduct of the review.

2.3.2 Community Conservation Plans

CCPs reflect each community's values and strategies for achieving conservation and management of renewable resources within the community's planning area.

There are five general goals that were followed to develop these Plans:

1. Identify and Protect Important Habitats and Harvesting Areas - To identify important wildlife habitat, seasonal harvesting areas and cultural sites (for example, cabin sites) and make recommendations for their management.

2. Develop Land Use Decisions - To describe the community process for making land use decisions and managing cumulative impacts which will help protect community values and conserve the resources on which priority lifestyles depend.

3. Promote Education - To identify educational initiatives for the Inuvialuit and others interested in the area which will promote conservation, understanding and appreciation.

4. Define Species Management - To describe a general system for wildlife management and conservation and identify population goals and conservation measures appropriate for each species of concern in the planning area. This will be done using the knowledge of the community and others with expertise.

5. Enhance Economy - To enhance the local economy by adopting a cooperative and consistent approach to community decision making and resource management. This approach will help ensure economic stability and maintenance of all components of the Arctic ecosystem.

In designating land management categories, the Inuvialuit communities have attempted to recognize priority land uses and activities, as well as areas of special ecological and cultural importance. Land designations may be modified as additional information becomes available and provided the health and biological productivity of the planning area is maintained.

Each area of importance has been given a letter designation corresponding to the categories below.

- Category A - Lands and waters where there are no known significant and sensitive cultural or renewable resources. Lands shall be managed according to current regulatory practices.
- Category B - Lands and waters where there are cultural or renewable resources of some significance and sensitivity but where terms and conditions associated with permits and leases shall assure the conservation of these resources.
- Category C - Lands and waters where cultural or renewable resources are of particular significance and sensitivity during specific times of the year. These lands and waters shall be managed so as to eliminate, to the greatest extent possible, potential damage and disruption.
- Category D - Lands and waters where cultural or renewable resources are of particular significance and sensitivity throughout the year. As with Category C, these areas shall be managed so as to eliminate, to the greatest extent possible, potential damage and disruption.
- Category E - Lands and waters where cultural or renewable resources are of extreme significance and sensitivity. There shall be no development on these areas. These lands and waters shall be managed to eliminate, to the greatest extent possible, potential damage and disruption. This category recommends the highest degree of protection for these lands.

2.4 Consideration of Sustainability Goals

The EIS must reflect consideration of local, regional, territorial and national goals for sustainable development, and whether and how the project promotes or inhibits these goals.

Considering sustainable development in the Review process includes recognizing:

- The potential environmental effects of the development.
- The capacity of natural systems to maintain their structure and functions and to support indigenous biological diversity and productivity.
- The capacity of the social and economic systems of the human environment to achieve, maintain or enhance conditions of self-reliance and diversity.
- The capacity of human environments, including local and regional institutions, to respond to and manage externally induced change.
- The attainment and distribution of lasting and equitable social and economic benefits from projects.
- The rights of future generations to the sustainable use of renewable resources.
- Protection and conservation of wildlife and the environment for present and future generations.

A development's contribution to sustainability can be demonstrated on the basis of the following:

- The extent to which the development makes a positive overall contribution towards environmental, social, cultural and economic sustainability – locally, regionally, territorially, and nationally.
- How the planning and design of the development affects achieving sustainable development.
- How monitoring, management and reporting systems have incorporated indicators of sustainability.
- How the public and communities have been given opportunity to participate in and contribute to the planning and design of the development and that their views have been considered in the review process.

3. Guidance on the Preparation of the EIS

The EIRB requires the Developer to submit an EIS which provides a project description, up-to-date information on the biological, physical and human environments, and the mitigation measures proposed to reduce or eliminate potential effects of the development on these environments. The contents of the EIS remain the responsibility of the Developer; however, the EIS must conform, at a minimum, to the requirements of the Terms of Reference for the EIS. The EIS will become the basis of the Public Review. The EIS should be made as complete as possible before it is provided to the EIRB, in order to reduce the time required to address deficiencies. The adequacy of the information base provided by the Developer will, to a certain extent, control the time required to prepare for and conduct the review.

Where information required for addressing any of the terms in the Terms of Reference was not obtained, is not complete, or is unavailable, the Developer should identify these areas. The Developer must also indicate how deficiencies have been overcome in the EIS (e.g., what steps will be taken to acquire the necessary information or what assumptions or extrapolations have been made to substitute for the necessary information), or how they will be addressed going forward (e.g., through Developer commitments, adaptive management, and/or in the regulatory process).

The design of the EIS shall address the concerns of those who are most affected and alleviate these concerns by developing measures that mitigate the potential impacts on the resources of concern, be they of a biological, physical, socio-economic or cultural nature.

The Developer is expected to prepare predictions for impacts which cannot be mitigated (residual effects). The impact predictions shall be formulated in such a manner that they can be tested during follow-up programs. The Developer shall prepare the impact predictions based on its understanding of the effectiveness of the proposed mitigation measures.

The Developer shall prepare follow-up programs which demonstrate that the effectiveness of mitigation measures can be tested so as to ensure communities, stakeholders and regulators that the impacts are as predicted and that mitigation measures to alleviate the impacts are effective. Alternatively, testing of the predictions shall expose the failures of the mitigation measures and allow for adaptive actions to be taken.

The Developer shall clearly describe its planning and engagement activities, as well as its analysis used to reach the preferred design options. The Developer shall demonstrate how results from public engagement and consultation activities, as well as TK, have been used to influence the preferred project design, the mitigation and remedial measures, and the contingency, management, and adaptive management plans.

Please note, throughout the rest of these EIS Terms of Reference, there are references made to “terms” (e.g., Terms 10 and 11, Term 9) or to “sections” (e.g., section 4.3). These references refer to specific sections, or terms, in the Terms of Reference. For example Term 9 refers to Chapter 9 of this document.

In preparing its EIS, the Developer shall:

- Provide sufficient information to identify, describe and determine the significance of residual impacts on the biophysical and human environments that could arise from the development (see Terms 10 and 11). Describe (quantify) the confidence in the environmental and socio-economic assessments conducted.

- Where appropriate, provide supporting documentation in separate volumes (as required) particularly on the details of the methods and results developed for the description of the Existing Environment (see Term 9), and reference this documentation by volume, section and page in the text of the main EIS.
- Include a concordance table showing where in the EIS each of the Terms of Reference is addressed. Reference to appendices and supporting documents should be included, as appropriate. Where any information required by the Terms of Reference is not provided in the EIS, the Developer should include the reasons for the omission.
- Where appropriate, reference rather than repeat information that has already been presented in other sections of the document. A key subject index is recommended.
- Prepare a commitments table that summarizes the proposed mitigation. In order to measure the effectiveness of the proposed mitigation, each mitigation measure shall be accompanied by benchmarks and milestones which help to understand what the expected outcome of the mitigation measure is, and at what time the outcome will be deemed successful (see Terms 12 and 13). Where the Developer cannot commit to benchmarks and milestones, the Developer shall commit to a schedule of when concrete benchmarks and milestones will be developed. This table shall be kept current throughout the EIS process.
- The commitments table will provide the framework for follow-up programs, including remediation, reclamation, and monitoring. The details of methods and targets for remediation, reclamation, and monitoring shall be provided in Environmental Management Plans (see Terms 12 and 13).
- The EIS should be written in the clearest language possible. Charts, diagrams, site plans, photos and maps should be provided wherever useful to clarify the text, including perspective drawings that convey what the developed highway would look like. Maps should be presented at a consistent scale to allow for comparison and overlay of mapped features (however, it is recognized that different features need to be presented at different scales, the developer is encouraged to limit the number of different scales as much as possible).
- The complete EIS shall be submitted in English. A glossary of definitions should be provided to ensure a clear understanding of terminology related to the development.
- The Executive Summary shall be submitted in English, and in the following Inuvialuktun dialects:

    - Siglitun
    - Uummarmiutun

- The EIS shall be provided in both printed and digital formats. The Developer shall provide electronic copies to the EIRB for the Registry, and electronic copies and the indicated number of printed copies of the EIS to the following organizations:

    - EIRB 15 copies.
    - Tuktoyaktuk HTC 1 copy.
    - Tuktoyaktuk Community Corporation 1 copy.
    - Inuvialuit Land Administration in Tuktoyaktuk 1 copy.
    - Inuvik Community Corporation 1 copy.
    - Inuvik HTC 1 copy.

- The Developer must also provide electronic and printed copies of the EIS to each of the regulators that will be issuing a licence, permit or other authorization for this project to proceed. The Developer is expected to coordinate the provision of these copies to each regulator as necessary.

4. Executive Summary

Provide a plain language Executive Summary that provides the reader with a concise but complete overview of the EIS and includes, as a minimum, the following information:

- Background on the Developer
- Development overview
- Development setting: geographic, physical, biological and human environments
- Key issues, findings and conclusions of the EIS

As it will be used as a stand-alone document, the Executive Summary should present information in a general manner focusing on the key issues and findings. The use of maps and figures to aid in the presentation of information is encouraged. The Executive Summary shall also be translated into the two identified Inuvialuktun dialects (see Term 3), which are spoken by some Elders and residents in Tuktoyaktuk and Inuvik.

5. Introduction

The Introduction should provide information related to the Developer, development overview, development setting, outline of the EIS process and required approvals, study strategy and methodology.

5.1 The Developer

This section shall introduce readers to the Developer, its consultants, and any contractors engaged for the development. Identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS. Contact information for all listed personal, contractors and sub-contractors should also be provided.

This section should also include a record of the environmental performance of the Developer in conducting similar developments.

5.2 Development Overview

This section of the EIS is intended to be a contextual summary of the development and component parts, rather than a detailed description of the development (see Term 6). In this section, briefly summarize the development, including its location, components and phases, spatial extent, temporal extent, workforce and equipment, associated activities, schedule and cost.

5.3 Development Purpose and Justification

Provide a detailed discussion of the purpose and justification for the development, including any regional and national interests as appropriate.

5.4 The Development Setting

This section of the EIS is intended to introduce readers to the development setting. Provide a general overview of the geographic, ecological, social, economic and cultural setting in which the development is proposed to take place. This section must also provide similar information for all considered alternatives.

5.5 Regulatory Approvals and Non-Regulatory Requirements

Identify the permits and authorizations required for the development. This information may be presented in table format, and should include cross reference to the sections of the EIS that correspond to the environmental information required for the permits and authorizations. The Developer will also provide information on all land-tenure requirements (including area and ownership), and on any non-regulatory requirements that may be needed for the development to proceed.

5.6 Study Strategy and Methodology

Describe the main steps carried out in the preparation of the EIS. For each step, describe and justify the approach, strategy, and methodology used. Include where any guidelines (e.g., water course crossing guidelines, granular resource guidelines) or best practices have been used or modified for use in the design and proposed construction and operation of the project. Any modification of guidelines or best practices should be identified and justified.

The Developer shall demonstrate how the following Goals and Principles (see Term 2) have been incorporated into the EIS Methodology.

5.6.1 Respect for and Use of Traditional Knowledge

The Developer is expected to demonstrate how TK was used to influence the planning, design and implementation phases of the proposed development. This should include details of how the Developer and TK holders have worked together to share knowledge and gain insight into creating a better development proposal. The Developer shall identify where TK and scientific knowledge differed and how these differences were resolved for the EIS and overall project planning.

The Developer shall:

- Describe TK Study methodology and, how TK was gathered and verified.
- Summarize issues, concerns, and recommendations arising from TK studies.
- Indicate whether, and how, issues, concerns, and recommendations were responded to.
- Explain how TK was incorporated into the environmental assessment and development planning, and provide examples of how TK influenced assessment results and overall project design

5.6.2 Involvement of Potentially Affected Communities and the Public

Engagement and consultation are important elements of the environmental impact screening and review process. In general, the Developer is expected to:

- Have knowledge and understanding of any issues and concerns in relation to the proposed development raised by potentially affected parties, including communities, regulators and other reviewers.
- Indicate how these issues and concerns have been or will be addressed if the development were to proceed.
- Demonstrate this understanding in its submissions required by the environmental impact review process.

In designing an engagement and consultation program, the Developer shall consider the following factors:

- **Extent of Consultation:** The amount of engagement and consultation must be tailored to the proposed development.

- **Consultation Schedule:** Potentially affected Parties must be given sufficient time and opportunity to learn about the proposed development and provide input or comment, recognizing that these do not necessarily occur in the same meeting or event.

- **Format of Consultation**: Engagement and consultation appropriate for environmental review should include face-to-face engagement where feedback is sought from potentially affected Parties through interactive dialogue. The Developer must strive to adapt meeting formats to the needs and preferences of audiences.

- **Parties Involved:** The Developer shall determine which potentially affected Parties to consult with, and the information that is appropriate to present and explain in consideration of the anticipated effects of the development. In accordance with the CCP for each community in the

ISR, the local HTC would normally provide the collective view or comments of the community. However, the Review Board expects Developers to consult with more than the HTC in each affected community.

The Developer shall provide a summary of the public engagement process in the EIS, including the following details with respect to all consultations associated with the proposed development:

- Community, competent authority or Party contacted.
- Contact names.
- Dates of contact.
- Communication/consultation format (e.g., email, phone, face-to-face meeting).
- Reason(s) for communication/consultation, and topic(s) of discussion, including the issues and concerns that were raised, and how the issues and concerns were responded to and/or resolved.
- Any commitments made by the Developer as a result of the communication/consultation.
- How the planning, design and/or implementation of the proposed development was influenced and/or changed as a result of consultation and by any issues and concerns raised.

5.6.3 Recognition of the Inuvialuit Final Agreement and Community Conservation Plans

The Developer is expected to have knowledge and understanding of how the proposed development may affect the various land categories identified in a community's CCP, in relation to the proposed development and to demonstrate this understanding in its submissions required by the environmental review process:

The Developer is expected to have reviewed any CCP that may apply to the area where the proposed development is located, specifically consulted with the appropriate communities and community organizations about any potential conflicts and, demonstrate this in the EIS submission. The Developer is encouraged to discuss the CPP information with communities and to confirm whether this information is current or requires updating. The Developer is also expected to identify any mitigation measures and commitments made to eliminate potential damage, destruction and other impacts potentially caused by the development to identified category lands and waters.

The Developer should present a plan for integrating its environmental management with relevant CCPs. The Developer must demonstrate how information and guidelines from CCPs and other regional plans will be adhered to and complied with.

5.6.4 Consideration of Sustainability Goals

The Developer shall summarize and report on the extent to which the EIS and the project have considered the principles of sustainable development and achieved sustainability goals. Provide a methodology and list of indicators used. The Developer shall also include a consideration of the following in preparing this section of the EIS:

- The extent to which the development makes a positive overall contribution towards environmental, social, cultural and economic sustainability – locally, regionally, territorially, and nationally.
- How the planning and design of the development have considered how it affects achieving sustainable development.

- How monitoring, management and reporting systems have incorporated indicators of sustainability.
- How the public and communities have been given opportunity to participate in and contribute to the planning and design of the development and that their views have been considered in the review process.

5.6.5 Precautionary Principle

A precautionary approach may be relevant in circumstances where it is identified that a Project activity could cause serious or irreversible adverse impact on the environment and the cause and effect relationships cannot be clearly established.

Identify elements of the EIS where the application of a precautionary approach may be warranted. For those circumstances, discuss whether the potential serious or irreversible adverse impact to the environment related to the Project can be avoided. Where potential adverse impacts cannot be avoided, describe ways to reduce the risk to the environment, including a discussion of Project design and available technology with respect to effectiveness and cost.

6. Project Description

The Project Description shall provide a detailed description of the physical works and activities associated with the road and related components of the development. Management plans, and a description of management related activities, that are deemed to be required by the Developer (e.g., Management Plans for Wildlife, Spill Management, Dust Management, Adaptive Management) must also be provided in sufficient detail for an impact review level of assessment (the EIRB realizes that most management plans get finalized and approved in the regulatory phase) for reviewers to be confident in the appropriateness of what is being proposed.

6.1 Route Alignment Alternatives

Based on community input from the October 2009 consultation sessions, a more detailed evaluation of several alignment options was completed. The Developer should provide information on the preferred alignment and the alternatives considered:

- **Preferred Alignment -** the 2009 Route, which is an updated and refined version of the 1977 Public Works Canada (PWC) alignment, but includes a minor encroachment on the Husky Lakes 1,000 m setback;
- **Alternative #1 -** a Minor Realignment of the 2009 Route to fully achieve the Husky Lakes 1,000 m setback requirements (this must include the recent ILA suggested extension to this alternative); and
- **Alternative #2 -** the Upland Route, which diverts west from the 2009 Route about 70 km north of Inuvik and re-joins the alignment near Source 177.

If these have changed, or been added to, since the submission of the Project Description, then the Developer must also include information about the changes and why the changes were made.

6.2 Scope of Project Components and Activities

Provide a description of all Project components that the Developer deems necessary for completion of the Project. This shall include a description of the location, the spatial extent (e.g., based on the VCs to be assessed), and the temporal extent/project phase (e.g., construction, operation, and where relevant, modification, decommissioning and abandonment) of the project component. This should include:

- All-season road from Inuvik to Tuktoyaktuk, NT
- Temporary winter road parallel to the all season road route
- Temporary winter road to access borrow and quarry sites
- Borrow and quarry areas to support construction, operations and maintenance requirements
- Construction equipment staging areas
- Construction material storage
- Construction staging areas
- Maintenance areas
- Excavation equipment storage areas
- Culvert, bridge and other water course crossing structures
- Other drainage and thermal erosion control structures
- Winter road water course crossings
- Fuel, oil and other bulk liquids storage areas
- Equipment maintenance, refilling and refuelling areas
- Temporary construction camp facilities
- On-going operations and maintenance of the all-weather highway

Describe related project activities, including the construction, operation and maintenance, and where relevant, closure, decommissioning and restoration of permanent and temporary structures associated with the above project components. Where possible, include a description of the location, spatial extent, and temporal extent (project phase) of the following activities and any other that the Developer deems necessary for the Project:

- Temporary electrical or other power supply
- Wastewater management and treatment
- Solid and other waste management, including incineration
- Water withdrawals
- Management of excavation material, including stockpiles
- Construction worksites, storage areas and staging areas
- Maintenance activities
- Handling and storage of petroleum products and hazardous materials
- Handling, storage and use of explosives (if required)
- Personnel, material, liquids, fuel and equipment resupply
- Vehicle movements and frequency during construction
- Aircraft use and frequency during construction
- The types, numbers, locations and frequency of use of all equipment associated with the development. For large mobile equipment include information on exerted ground pressures, and techniques used to reduce these ground pressures. Include a discussion of the seasonal use of all equipment.

6.3 Development Phases and Schedule

Describe related project activities, including the construction, operation and maintenance, and where relevant, closure, decommissioning and restoration of permanent and temporary structures associated with the development. Where possible, include a description of the location, spatial and temporal extent (project phase) of the following:

Workforce:

- The number of workers required by occupation and/or skill.
- The duration of work, including rotation length, if applicable.
- Work location and camp location.
- Full time vs. part time work.
- Education requirements by occupation or skill.
- Literacy and language requirements.
- An estimate of the proportion of local, regional, Northwest Territories (i.e., Inuvialuit), and out-of-Project area workers.

Describe the following aspects of the development in relation to the development phases and schedule:

Responsibilities:

- Identify which government agencies or departments are responsible for the maintenance and operation of the highway.
- Identify which government agencies or departments are responsible for funding the planning, construction and operation of the highway.
- Identify the roles and responsibilities of the Hamlet of Tuktoyaktuk and the Town of Inuvik.

Cost:

- Identify the overall capital cost of the Project.
- Identify the anticipated sources and amounts for capital and, operating and maintenance costs.
- Identify any other anticipated costs that may be required, including remediation costs.

6.3.1 New Work and Additional Field Studies Required

The Developer shall describe all new work and field studies that are still required to support the successful permitting of this development proposal, including any new field work applied for and/or completed since the filing of the Project Description. The proposed schedule, timing of data collection and analysis, and how these results may affect the environmental review and the final design of the development must be discussed. The Developer must provide explanations as to why this information was not included in the current development submissions.

6.4 Life of the Project

The Developer shall clearly describe the operational life of the Project and how this development fits with the overall goals, objectives and long term planning of the Government of the Northwest Territories (GNWT) for Territorial Highways. In this discussion, the Developer shall include the following:

- Identify which government agencies or departments are responsible for the long term maintenance and operation of the highway.
- Identify where funding for the long term operation and maintenance of the highway will come from.
- Identify and quantify the anticipated short, medium and long term use/users of the highway.
- Discuss how government would respond to and manage the highway, if an increase in the number of heavy industrial users evolves over time (which may, for example, result in increased operation and maintenance costs).
- Discuss how this highway may contribute to the overall plans and objectives of the Government of Canada (e.g., sovereignty, or other considerations).

6.4.1 Other Parties

The EIRB recognizes the GNWT has partnered with the Hamlet of Tuktoyaktuk and the Town of Inuvik to support and promote this development proposal. The EIS must clearly identify the roles and responsibilities of these other partners in all phases of the development. This shall include a discussion of their roles and responsibilities in the long-term management of the highway.

7. Consideration of Alternatives

The Developer is expected to include an analysis of alternative options to, and means of carrying out the proposed development that are technically and economically feasible. The economic considerations and the environmental effects of any options to and alternative means of carrying out the components of the development shall also be discussed and assessed. When assessing development alternatives, the Developer shall take into account the relations and interactions among the various components of the ecosystem, including affected communities. Further, the Developer will demonstrate how all alternatives contribute to sustainable development in the ISR.

7.1 Alternative Means of Carrying out the Project

The EIS must identify and describe alternative means (e.g., construction, scheduling phases, technical design) to carry out the project that are, from the perspective of the Developer, technically and economically feasible. The EIS must also describe the environmental effects of each alternative means. In describing the preferred means, the EIS should identify the relative consideration of environmental effects, and technical and economic feasibility. The criteria and/or constraints used to identify any alternative means as acceptable or unacceptable, and how these criteria and/or constraints were applied, must be described.

The Developer shall describe the alternative means of carrying out the components of the development, including:

- A description of the alternative means considered, how or why they are not technically and/or economically feasible, and the rationale for rejecting any alternatives that are excluded from further assessment.
- The identification of the environmental effects of the various route alternatives.
- The criteria and rationale for selecting the preferred alternative means.

7.2 Alternative Route Options for the Project

The Developer shall identify and describe the alternative routes considered for the development (see Term 6.1), including:

- A description of each alternative considered, how or why they are not environmentally, technically and/or economically feasible, and the rationale for rejecting any alternatives that are excluded from further assessment.
- The criteria and rationale for selecting these preferred alternative routes, and the environmental, social and technical constraints associated with them.

The Developer shall provide some level of environmental assessment of the alternative routes in the review process to substantiate their inclusion as viable alternatives, even if they are not being considered as the Developer's preferred route. If the EIRB determines the alternative routes should be considered as possible options, then additional information will be requested, if it is not provided in the EIS, to allow a full and complete assessment of the development proposal.

The Developer shall clearly state what makes its preferred alignment safer than the alternative routes. This should include identifying which parts of the alternate routes are dangerous and why, how many dangerous areas are present in each of the three routes, how much additional risk is posed by these dangerous features compared to the preferred alignment, what mitigations can be put in place to alleviate these additional risks and what the cost of these additional risk mitigation features would be.

The Developer should clearly state the sources of information used in these determinations and clearly identify all rationale used to reach conclusions, including how community engagement and consultation and TK have influenced these determinations. Linkages to valued components used in the impact assessment should also be included where possible.

8. Key Issues and Study Area Boundaries

8.1 Key Issues

If the valued ecosystem component (VEC) and valued socio-economic component (VSC – this includes cultural considerations) approach is used, the VECs and VSCs (referred to collectively as valued components (VCs)) for which effects are predicted must be described and justified. In identifying the valued components, the Developer shall consider those identified to be of concern during any workshops or meetings held by the Developer, in CCPs, in the Inuvialuit Final Agreement (IFA), or that the Developer considers likely to be affected by the development. In justifying the methods used to select the VCs, the Developer shall note that the value of a component not only relates to its role in the ecosystem, but also to the value placed on it by the Inuvialuit. The latest CCPs should be consulted in determining which valued components to utilize.

If using the valued components methodology, the Developer shall include and consider the following elements, in addition to any other elements considered appropriate:

- Species at risk and species of special status or management (see Term 10.1.5).
- Water quantity and quality.
- Changes to hydrological regime.
- Land and resource use by the Inuvialuit.
- Areas of special ecological and cultural importance (e.g., Husky Lakes and the 1,000 m set-back).
- Noise.
- Permafrost and terrain.
- Land designation areas as identifies in applicable CCPs and the IFA.
- Tourism, commercial and public recreational use.
- Heritage and archaeological sites.
- Cumulative effects.

In discussing the key issues, the Developer shall include a discussion of how the three alignments are perceived by members of the Tuktoyaktuk and Inuvik communities, including the positive and negative concerns of each.

If another method is used to predict potential environmental and socio-economic impacts of the development components, the developer must identify and justify the biophysical or socio-economic elements for which effects are predicted, and must also include the elements identified above.

8.2 Study Boundaries

8.2.1 Spatial Boundaries

For all components of the development, the Developer shall define the appropriate boundaries used for the assessment for each biophysical or socio-economic element assessed. The Developer shall also provide justification and rationale for all of the study area boundaries chosen. The Developer shall provide a description of the boundaries of the development in a regional context showing existing and planned future land use, surface disturbance, and any current infrastructure.

8.2.2 Temporal Boundaries

The temporal boundaries of the development components shall cover the construction, operation, maintenance, and where relevant, closure, decommissioning and restoration of the sites affected by the development. Temporal boundaries shall also consider seasonal and annual variations related to environmental components for all phases of the development, where appropriate.

To determine the temporal boundary of assessment, the Developer shall take into account the following elements:

- Duration of the operational period.
- Design life of engineered structures.
- Frequency and duration of natural events and human-induced environmental changes.

9. Existing Environment and Baseline Information

The EIRB encourages the Developer to use a goal-oriented approach to achieve human and biophysical environmental protection in the design, construction, operation, maintenance, decommissioning and restoration of the proposed development and activities, and associated temporary developments and activities, in order to achieve a more sustainable development. The Developer shall identify all potential direct and indirect biological, physical and human elements which could be affected by the proposed development. Elements which should be considered, and their corresponding goal statements, are outlined in Table 1. If the Developer believes that some elements listed in Table 1 do not apply to the proposed development, the Developer must clearly describe the reason(s) and provide a valid justification for not addressing these elements. The Developer is also encouraged to add (and justify) other elements that may be required to properly assess the proposed development.

In order to properly assess the potential effects resulting from the proposed development, the baseline or existing environmental and socio-economic conditions need to be properly described. The goal statements in Table 1 identify the ideal goal for each element with the development in place. The impact assessment section (see Term 10) should address the appropriate elements identified as VECs and/or VSCs, or identified through another means, and a discussion of the achievability of the goal statements should also be provided. The Developer should also identify those goal statements that cannot be achieved in whole or in part for the construction and operation of the development (including construction, operation and decommissioning of temporary associated developments and activities), and should also provide an explanation and discussion of the expected impacts.

The description of the biophysical and human environment should focus on the relevant issues (the Developer should seek guidance from the IFA and CCPs). The Developer must provide a description of the local setting to allow the Review Board and others to clearly understand the rationale for assessment decisions. Although baseline data should be representative of current conditions, the Developer shall consider the historic (pre-disturbance or pre-development) biophysical and human environment conditions in their impact assessment (see Term 10).

If baseline data have been extrapolated or manipulated to depict environmental conditions in the Study Area(s), modelling methods should be described in detail, and should include accuracy assessments, and other relevant statistical information such as confidence intervals and margins of error.

Some Terms of Reference contain both a “Baseline” and “Assessment” section, and present detailed lists of baseline data information that should be collected. The benefit of this approach is that it gives the proponent a clear understanding of what is expected. At the same time, it is rather prescriptive, and if the Developer meets all the terms of the “Assessment” section, or determines and justifies why certain elements are not required or appropriate, they should have had to collect and consider all relevant baseline data information. To avoid being too prescriptive, while at the same time, providing sufficient guidance to the Developer, detailed lists of baseline information are provided in the Appendices.

Table 1 Biological, Physical, and Human Elements and Goal Statements

Element	Goal Statements
Migratory Birds and Habitat	Protect and avoid disturbance or destruction to migratory birds and their habitat throughout all phases of the proposed development.
Species at Risk	Avoid the loss, damage or destruction of species at risk and their critical habitat throughout all phases of the proposed development.
Wildlife and Wildlife Habitat	Protect all wildlife and wildlife habitat and minimize habitat losses throughout all phases of the proposed development.
Fish and Fish Habitat	Protect all fish and fish habitat and establish a “no-net-loss” of fish habitat throughout all phases of the proposed development.
Vegetation	Maintain the diversity of all vegetation communities throughout all phases of the proposed development.
Water bodies and Wetlands	Conserve and minimize or avoid negative impacts to all water bodies and wetlands throughout all phases of the proposed development.
Soil	Protect and sustain soils and minimize losses through erosion throughout all phases of the proposed development
Surface water and Groundwater	Protect or minimize impacts to all ground and surface water throughout all phases of the proposed development.
Permafrost	Protect and minimize impacts to permafrost throughout all phases of the proposed development.
Noise	Minimize anthropogenic noises throughout the duration of the proposed development.
Climate Change	Minimize contributions to climate change throughout all phases of the proposed development.
Air Quality	Minimize air pollution throughout all phases of the proposed development.
Navigation	Avoid impeding navigation throughout all phases of development.
Wildlife Harvesting	Conserve species used for wildlife harvesting throughout all phases of the proposed development.
Culture, Heritage and Archaeology	Preserve culture, heritage and archaeology throughout all phases of development.
Communities	Minimize or avoid negative impacts to local communities throughout all phases of the proposed development
Economy	Pursue economic development opportunities that do not adversely impact environmental, social, and cultural conditions/wellness
Human Health and Safety	Avoid negative impacts to human health and safety throughout all phases of development
Land Use	Protect important land use areas.
Participation Agreement (IBA) if required	Commitment from the Developer to participate (section 10 of the IFA.)
Other elements required by the EIRB, or identified as important by the Developer	TBD; and as defined in the EIS Terms of Reference by the EIRB, or in the EIS by the Developer.

9.1 Biophysical Environment

The Developer is expected to have an understanding of the biophysical environment (e.g. land, air, water, vegetation, wildlife, fish and harvesting of potentially affected elements) associated with the proposed development area, and be able to demonstrate this understanding in its submissions.

The developer is expected to gather and present publicly available data, much of which will be quantitative in nature, and available through federal, territorial, regional and municipal agencies and organizations. Where data is not available at the community level, regional or territorial level data should be presented, and it should be noted that community level data is not publicly available.

Discussions with key community and agency representatives and informants will assist in:

- Verifying baseline conditions
- Gathering additional or qualitative data to support available quantitative data
- Gathering quantitative data (if it is provided) where none is available publicly
- Gathering qualitative data to fill gaps where no quantitative data is available

Input obtained through community consultations can also be used to verify baseline conditions.

Appendix A contains guidance on the type and extent of the information required by the Review Board to fully understand the biophysical setting or “state-of-the-environment” in the study area.

9.2 Human Environment

The Developer is expected to have an understanding of the human environment (e.g. human use and potentially affected communities) associated with the proposed development area and demonstrate this understanding in submissions required by the environmental impact review process.

Appendix B contains guidance on the type and extent of the information required by the Review Board to fully understand the human environment setting in the study area.

10. Impact Assessment

The Developer shall clearly state the methods used in its assessment of the environmental effects of the development in order for reviewers to fully understand the rationale, logic, assessment process, and conclusions reached. In this description, the Developer shall consider environmental effects, such as direct and indirect, reversible and irreversible, short- and long-term and cumulative environmental effects of all development components over all phases of the development, including long-term operations and maintenance. In predicting and assessing the development's effects, the Developer shall clearly state the elements and functions of the environment that may be affected, specifying the location, extent and duration of these effects and their overall impact. This assessment shall focus primarily on the biophysical and socio-economic elements (valued components) identified for the development (see Terms 10.1 and 10.2).

For each element in Table 1, a goal statement has been developed with the intention of reducing the effects of the proposed development on the biological, physical and human environments. Impact predictions and the environmental impact assessment can be made against the elements and associated goal statements. Confidence associated with impact predictions should be described (quantified or measured) so that testable questions can be formulated to guide follow-up and monitoring programs (see Term 13).

The Developer shall consider the historic (pre-disturbance or pre-development) biophysical and human environment conditions in their impact assessment and when developing mitigation and reclamation plans.

Please note, this chapter refers to the valued components (VC) approach; if an alternative approach was used, then this chapter should be read and incorporated as such.

10.1 Biophysical Components

The Developer shall assess the potential impacts of the Project on the VECs selected for the physical environment, and assess the areas of concern as outlined in Terms 10.1.1 through 10.1.11. For each VEC selected, the information must be sufficient to allow the Review Board to understand the nature of the potential impacts and how the Proponent's conclusions were reached. The assessment must provide a clear path or presentation of information from the baseline (current) conditions through the identification of potential impacts, mitigation, residual impacts and determination of significance. As appropriate, consider how natural variation or events (e.g., Climate Change) could affect the descriptions of Project impacts.

10.1.1 Terrain, Geology, Soils and Permafrost

Describe and evaluate the potential impacts of the Project on terrain, geology, soils and permafrost, including a consideration of:

- Slope and soil stability.
- Erosion on overland low angle sloping terrain.
- Subsidence.
- Granular resource extraction areas (include quantity and quality of granular resources).
- Thaw slumps and compaction of organic peatlands and potential for melt of ice-rich ground.
- Drainage beside and beneath the road.

- Channelization and non-channelization flow.
- Consideration of mitigation to prevent degradation of permafrost.

With respect to potential impacts of the Project on permafrost, include the consideration of:

- Permafrost as a design feature in the road bed; failure modes analysis and associated contingency plans.
- Thermal condition, active layer thickness, thaw depth, distribution and stability.
- Ice rich soils (thaw settlement, thermokarst) permafrost thaw and related settlement.
- Frost heave of frost susceptible soils in thin permafrost as well as seasonally frozen soils.
- Thaw or settlement-related impacts on drainage and surface hydrology – see also Term 10.1.4 - Water Quality and Quantity).
- Shorelines, channels, taliks.
- Combined impacts of the Project and tundra fires.

10.1.2 Air Quality

Describe and evaluate the potential impacts of the Project on air quality including a consideration of:

- The Project activities and components which would be sources of air emissions.
- Emissions of concern by source for each Project phase, including quantity, timing and duration, normal operation conditions and upsets.
- If appropriate, secondary particulate matter, diesel particulate matter, and air pollutants on the List of Toxic Substances in Schedule 1 of the *Canadian Environmental protection Act, 1999* (CEPA Registry, 1999).
- Air quality parameters that could be affected by these emissions (e.g., dust, particulates (PM10 and PM2.5), sulphur oxides, nitrogen oxides, methane, carbon dioxide, carbon monoxide, volatile organic compounds, formaldehyde, ground level ozone (O3), odour, etc.).
- Acid deposition.
- How changes in air quality could impact humans, wildlife and vegetation (short-term and long-term over the Project lifespan).
- Ice fog, visibility.
- Terrain.

Relevant territorial, provincial and federal air quality standards or guidelines should be discussed, including their purpose and use in relation to the Project phases. The discussion of air quality effects should also consider the Canadian Counsel of Ministers of the Environment's (*CCME's) Guidance Document on Continuous Improvement (CI) and Keeping-Clean-Areas-Clean (KCAC) Canada-wide Standards for Particulate Matter and Ozone.*

The Developer shall provide an assessment of the potential health impacts to humans, wildlife and vegetation related to Project emissions for all Project phases. Dust suppression techniques must also be discussed and evaluated in this assessment.

10.1.3 Noise

The Developer shall describe and evaluate the potential impacts of Project-related noise, including a consideration of:

- Project components or activities that could produce noise levels of concern, including source location, timing and duration.
- Terrain and weather.

- Disturbance to fish, wildlife and birds (see also Terms 10.1.6 and 10.1.7), including barren ground caribou and grizzly bear.
- Disturbance of harvest and recreational activities, including tourism.
- Potential impacts to harvesting activities.
- Impacts to communities.

Relevant territorial, provincial and federal noise standards or guidelines should be discussed, including their purpose and use in relation to the Project phases.

The Developer will provide a comparison of anticipated noise levels along the highway with current industrial, municipal or ambient noise levels.

The Developer shall provide an assessment of the potential health impacts related to Project-related changes in noise levels, including potential impacts of sleep disturbance and annoyance. Describe the proximity of the Project to sensitive receptors (e.g., human residences/cabins, camps, harvesting areas) and environmental elements (e.g., Husky Lakes, identified VCs).

10.1.4 Water Quality and Quantity

Describe and evaluate the potential impacts of the Project on water quality and quantity, including a consideration of:

- Changes to surface drainage patterns and surface water hydrology including changes caused by Project-related impacts on terrain, soils and permafrost (also see Term 10.1.1 Terrain, Geology, Soils and Permafrost and Term 10.1.6 Fish and Fish Habitat).
- Hydrogeological resources.
- Drinking water quality for humans and wildlife.
- Recreational water quality.
- Discharge or seepage of wastewater effluent, contaminants, chemical additives, etc.
- In-stream activities (e.g. watercourse crossings).
- Changes to water quality at water crossings (bridges, culverts and other wetted areas).
- Changes to water quality due to thaw slumps.
- Erosion, sediment deposition, sediment re-suspension.
- Dust and dust suppression.
- Increased turbidity.
- Subsidence.
- Slope stability.
- Flow or water levels including the formation of frost bulbs and related icings at watercourse crossings (also see Term 10.4 Effects of the Environment on the Project).
- Water withdrawal and volume of withdrawal (e.g., for ice roads, potable water, dust suppression).
- Gravel extraction.

10.1.5 Species of Concern

The purpose of the federal *Species At Risk Act* (SARA) is to: prevent wildlife species from being extirpated or becoming extinct; to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; and, to manage species of special concern to prevent them from being endangered or threatened. SARA provides lists of wildlife species at risk that include mammals, birds, reptiles, amphibians, fish, lepidopterons, plants, lichens, mosses and molluscs.

The Developer must consider any change that the Project may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of SARA (see definition of impact on the environment in SARA Appendix 3, Definitions). Accordingly, the Developer shall take into account the requirements of SARA and provide the information necessary to evaluate the potential impacts of the Project on the species contemplated by this Act including mitigation and monitoring. All direct, indirect and cumulative effects should be considered. Species under consideration should also include those listed on Schedule 1 of SARA, and those designated as at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

In addition to considering those species identified through engagement and consultation events with communities, and any other species deemed necessary by the Developer, the Developer shall also take into consideration the GNWTs *Species at Risk (NWT) Act* which applies to any wild animal or plant species managed by the GNWT, on both public and private lands, including private lands owned under a land claim agreement.

Discuss the potential impacts of the Project on species of concern and proposed mitigation in relation to applicable legislation, policy, management plans, recovery strategies, action plans or land use planning initiatives. In part, the Developer shall demonstrate to the Review Board in the EIS that the IFA, relevant CCPs and the results of any TK and community consultation activities were used to shape the approach taken to assess impacts to species of special management concern.

10.1.6 Fish and Fish Habitat

The Developer will describe and evaluate the potential impacts of the Project on VECs related to fish and fish habitat, including:

- Proposed watercourse crossings and temporary vehicle crossing methods:
    - for each proposed method, describe timing and duration, the anticipated extent of physical disturbance, blockages or changes to flow patterns, need for blasting and the factors that would influence these issues;
    - for each method, describe how habitat could be altered, and
    - identify any criteria that would be used to select the methods to be used for each watercourse crossing (e.g., stream classification).

- Standards or guidelines related to watercourse crossings that would be applied.
- Relevant policies, management plans or other measures to protect or enhance fish and fish habitat, including timing restrictions, protected areas or regulations.
- Disruption of sensitive life stages or habitat (e.g., spawning and incubation, rearing, refugia, overwintering) including loss of substrate habitat, known sensitive or important sites.
- Features such as in-stream structure, riparian zones, water quality and flow regimes.
- Impacts on food resources.
- Impacts on water quality or quantity (see Term 10.1.4).
- Distribution or abundance.
- Sensitive or important areas or habitat.
- Contaminant levels in harvested species that could be changed by the Project, if applicable.
- Fish health and condition.
- Blockages to movement.
- Blasting (if required).
- Dredging or disposal of sediments.
- Underwater noise associated with Project activities.

- Water withdrawal.
- How Project-related changes in harvest pressures could impact the resource.

Specifically, the duration and geographic extent (distance downstream impacts can be anticipated) of potential impacts should be discussed in relation to how fish populations and harvest activities could be affected (with particular attention given to Husky Lakes and the Fish Lakes and Rivers Management Area). Describe any works or undertakings that may result in potential impacts to fish and fish habitat that cannot be avoided or mitigated, and that may result in harmful alteration, disruption, or destruction (HADD) on fish habitat.

With respect to restoration of fish habitat, describe:

- The condition(s) to which the ROW (instream and riparian) and temporary work areas would be reclaimed or restored, and maintained once construction has been completed.
- Criteria for evaluating the success of mitigation or reclamation measures, and indicate when and how this evaluation would be conducted (see also Term 13 Follow-up and Monitoring).

For follow-up and monitoring, the Developer shall develop a monitoring program for the fish and habitat resources of water bodies along the highway corridor.

10.1.7 Wildlife and Wildlife Habitat

Describe and evaluate the potential impacts of the Project on VECs related to wildlife or wildlife habitat, including a consideration of:

- Direct and indirect alteration of habitat including Project footprint impact.
- Visual or auditory disturbance, including habitat avoidance and effective habitat loss in relation to Project facilities or activities.
- Wildlife mortality due to harvesting and vehicle collisions.
- Disruption of sensitive life stages or habitat (e.g., migration, calving, denning, overwintering).
- Wildlife movement patterns, home ranges, distribution and abundance.
- Sensitive or important areas or habitat.
- Population cycles.
- Predatory-prey relationships.
- Increased human-wildlife interactions.
- How Project-related changes in harvest pressures could impact the resource.
- Contaminant levels in harvested species that could be changed by the Project.
- Wildlife health and condition.

Specifically, the Developer shall discuss the duration and geographic extent (e.g., distance of noise related disturbance) of potential impacts in relation to how wildlife populations and harvest activities could be affected.

10.1.8 Birds and Bird Habitat

Describe and evaluate the potential impacts of the Project on VECs related to birds and bird habitat, including a consideration of:

- Disruption of sensitive life stages or habitat (e.g., nesting, rearing, staging, moulting, migrating).
- Direct and indirect alteration of habitat (e.g., siting of Project facilities, watercourse crossings, habitat quality) including footprint.
- Sensitive or important areas or habitat.

- Visual or auditory disturbance, including habitat avoidance in relation to Project facilities or activities and light disturbance.
- Bird distribution or abundance.
- Contaminant levels in harvested species that could be changed by the Project.
- Bird health and condition.
- How Project-related changes in harvest pressures could impact the resource.
- Project-induced subsidence.
- Highway maintenance.
- Attraction of predators of birds and bird eggs to the project, or the provision of nesting or denning habitat for predators and scavengers.
- Potential mortality from collisions with temporary or permanent tall structures or wires.
- Potential mortality from vehicle collisions.

10.1.9 Vegetation

The Developer shall describe and evaluate the potential impacts of the Project on vegetation, including a consideration of:

- Alteration or loss of species, or vegetation assemblages that are rare, valued, protected or designated sensitive or important areas or habitat.
- Sensitive or important areas.
- Introduction of non-native and/or invasive species.
- How road dust might impact vegetation and surface albedo (surface reflectivity of sun's radiation) near highway.
- How changes might impact permafrost and the highway itself.
- Changes to the soil, hydrological or permafrost regimes.
- Re-establishment of vegetation and reclamation of borrow sites and other disturbances (particularly identification of vegetation types and seed mixes to be used, and identification of the specific borrow site to be re-vegetated, and those borrow sites that will not be re-vegetated).
- How Project-related changes in harvest pressures could impact vegetation resources.
- Changes in contaminant levels in harvested species that could be changed by the Project, including parts of plants such as roots, leaves and berries.
- Vegetation control.

10.1.10 Biodiversity

The Developer shall describe the changes to the biodiversity of the Study Area(s) during construction, operations and any post-reclamation and the significance of these changes in a local and regional context. Describe how the Project could result in changes to biodiversity, including a consideration of:

- Ecosystem and habitat loss.
- Habitat fragmentation / barriers to movement and gene flow.
- Ability of habitat or species to recover.
- Response to edge effects.
- Species distribution and abundance.
- Invasive/non-native species.
- Changes to special management areas (see IFA and CCPs).
- Pollution – spills, runoff, water and emissions to air.
- Species of special management concern (see IFA and CCPs).
- Project-related changes in harvest levels.
- Changes to important habitat areas.

10.1.11 Country Foods

Many of these biophysical components are, or are linked to, the country foods harvested by local residents. The Developer shall identify these linkages and related sources of contaminants and other impacts in a separate discussion on the potential contamination of country foods. The discussion shall include the identification of which country foods are consumed, or expected to be consumed, which contaminants are of concern and an indication of whether transport pathways of contaminants into country foods will result from the proposed project and associated activities.

10.2 Human Environment Components

10.2.1 General

Describe and assess the positive and negative impacts of the Project on the VCs selected for the human environment. Further, describe and evaluate the changes to social, cultural, and economic conditions that may occur as a result of Project-related biophysical impacts.

Broadly, consider the social, cultural, and economic impacts, both positive and negative, of year-round access between Tuktoyaktuk and Inuvik, and opened access to harvesting areas and areas of ecological and cultural importance.

Indicate how the direct and indirect impacts of the Project may enhance and/or impair the current social, cultural, and economic ways of life in the communities, and community aspirations for the future. In the assessment, consider the particular needs and interests of various segments of the local populations (e.g. youth, elders, women, harvesters), and identify how the Project may affect each of them.

Identify possible reactions to Project-related effects, as well as the capacity of local residents, communities, and institutions to respond to the Project. Consider and describe how people, communities, institutions, and governments might be expected to adapt to Project-induced changes to the human and biophysical environments.

In considering and assessing local impacts, take into account how such impacts are perceived by local residents. Give attention to the attitudes and perceptions of local residents, and how these are grounded in their culture, social organization, and historical experience.

Identify where there are limitations in the ability to accurately or completely identify any of the potential effects, and if possible, identify information or activities that would contribute to a more comprehensive assessment.

With respect to mitigation measures to reduce or offset adverse effects on the way-of-life and well-being of individuals, families and communities most directly affected by the Project, indicate how mitigation would address impacts experienced by residents: by age group, gender and ethnicity (where appropriate), and describe how Inuvialuit organizations will be involved in the development, application and ongoing evaluation of these measures.

Identify the responsible party or parties for the implementation of mitigation measures. If possible, identify where there may be limited effectiveness in the success of mitigation measures if responsible parties are not informed or resourced to implement mitigation measures.

10.2.2 Demographics

Describe and evaluate the potential impacts of the Project on demographics and mobility, including a consideration of:

- Age and gender.
- Residence patterns.
- In/out migration, by community and for the Inuvialuit Settlement Region (ISR).

10.2.3 Regional and Local Economies

Describe and evaluate the potential impacts of the Project on local, regional (ISR), and territorial economies, including consideration of:

- The contribution of the proposed Project to the gross domestic product (GDP) provided separately for direct, indirect and induced economic activities for the regional (to the extent possible), provincial, territorial, and national economies.
- Direct taxes (estimated) for business and persons including royalties, corporate income taxes, and personal income taxes, employer and employee contributions to EI and CPP and other indirect taxes for business (e.g. NWT fuel and payroll taxes) and persons. Provide separate estimates for the federal, territorial, and regional governments.
- Employment and income for every year of construction and operation, with particular reference to wage and salary employment by length of employment, form of employment (full time, part-time, seasonal), skills category, gender and age. Include estimates of the following:
    - territorial, regional, local and Inuvialuit participation, by gender
    - opportunities for participation in wage and salary employment, considering such factors as:
        - disincentives and constraints for local participation in employment (e.g., social assistance, housing assistance and related policies)
        - the extent to which the skills of the available workers match the job requirements
        - the level of interest in Project-related work
        - commuting arrangements to allow these workers to reach the work site
    - how any unionized labour used by the Developer could impact employment and income, including a consideration of
        - hiring opportunities, priority hiring practices
        - skill or certification requirements
        - the equitable distribution of benefits to residents and communities in the Project area
    - competition for labour between the Project and existing businesses, government institutions and traditional activities and related wage and salary impacts
    - community income and household economics, including subsistence activities and the sustainability of traditional economies
    - local consumer prices, inflation and costs of living, particularly with regard to food, transportation, utilities, and shelter
    - how Project-related impacts on harvested resources or harvest activities (both positive or negative) affect community income and household economies, and sustainability of traditional economies

- activities such as tourism, outfitting, trapping, commercial harvesting and recreation, including increased opportunities, and opportunities that are lost or deferred as a result of Project construction, or lost as a result of Project operation
- opportunities for local, regional and territorial businesses to supply goods and services to meet demand created by the Project
- local and regional spin-off economic activity (i.e., indirect and induced effects) created by, for example, the expenditure of new income by employees of, and suppliers to, the Project, by increased year-round vehicular/person traffic, as well as increased tourism
- opportunities to diversify the local, regional and territorial economic base to produce and to supply new goods and services
- distribution of costs and benefits of Project activities at local, regional, and territorial levels
- poverty levels
- competition between land users as a result of modifications to, or displacement from, the land resulting from the Project
- constraints that could affect economic benefits or opportunities
- consistency and compliance with local and regional land use plans
- consistency with goals and objectives identified in territorial, regional and community economic development plans and strategies

Discuss potential leakage of economic benefits into or out of the Project area after the construction phase.

Include information regarding any hiring practices and policies and any preliminary arrangements already made for labour. Also indicate if these provisions will apply to any sub-contractors.

10.2.4 Education, Training and Skills

Describe and evaluate the potential impacts of the Project on education, training and skills, including a consideration of:

- Participation in education and training, by age, gender and ethnicity.
- Educational achievement and attainment.
- Literacy levels (English and Inuvialuktun).

Discuss the education and training programs required for Project-related construction and operation employment, including:

- Local and regional training opportunities available to local people.
- Timing and duration of programs, in relation to the Project schedule.
- Which skills and experience gained in the Project workforce that could be applied to other available projects or sectors.

Describe any programs that would be provided by, or sponsored by, the Proponents.

In particular, discuss which types of programs could be completed in time to qualify for Project–related employment (in both the construction and operation phases) and which could not. Identify when training would have to start in order to be complete when jobs would be available.

10.2.5 Infrastructure and Institutional Capacity

Describe and evaluate the potential impacts of the Project on infrastructure and institutional capacity, including a consideration of:

- Temporary and permanent changes to infrastructure and services and the capacity of institutions and organizations to deliver those services identified in the baseline description. Special consideration shall be given to:
    - transportation (roads, airports)
    - local law enforcement
    - medical care
    - social and community support services, including drug and alcohol centres and counseling, child care, elder care
    - education
    - recreation
    - water, sewage and waste disposal
    - incineration of waste
    - quarries and quarry materials available to local and territorial governments
    - management of renewable resources
- Changes in the capacity of the service industries to provide local goods and services.
- Changes in the availability, quality and affordability of housing in communities, including factors that influence accessibility to housing (e.g. age, gender).

Describe measures to address any changes in the level of demand for infrastructure and institutional capacity. Include an estimate of incremental costs to municipal, regional, territorial, and federal governments resulting from the Project.

10.2.6 Human Health and Community Wellness

Describe and evaluate the potential impacts of the Project on human health and community wellness, including a consideration of:

- Local perceptions of physical, mental and social health and changes in the quality of life, including differences or similarities in perceptions within and between Inuvik and Tuktoyaktuk.
- Measures of mortality and morbidity, and of social pathology and dysfunction such as teen pregnancies, sexually transmitted infections, communicable diseases, substance abuse, family violence, and crime.
- Changes in diet and use of country food.
- How Project-related changes in the quality of country food affect health, including possible sources of contaminants, exposure pathways and consumption patterns (i.e., age group, sex).
- How Project-related impacts on harvested resources or harvest activities affect health and wellness.
- Describe and evaluate potential impacts that may arise from changes in water quality and air quality.
- Poverty and homelessness.
- Literacy skills and education levels.
- The presence or absence of support systems and programs, regionally and locally and their capacity to address human health and community wellness.

The Developer is encouraged to refer to Health Canada`s document *Ùseful Information for Environmental Assessment*`, which can be found at www.hs-sc.gc.ca/ewh-semt/pubs/eval/environ_assess-eval/index-eng.php/a2 .

10.2.7 Socio-cultural Patterns

Describe and evaluate the potential impacts of the Project on social and cultural patterns and cohesion, including a consideration of:

- How Project-related impacts on harvested resources or harvest activities affect social and cultural patterns and cohesion.
- Traditional lifestyles, values and culture.
- Cultural and spiritual life of the communities, including language loss or retention
- Patterns of social organization at the household and community level, including the organization of work, mutual aid and sharing
- Family dynamics or structure, including child and elder care
- How the influx of tourists, and potential influx of project-related employees for future projects and workers could impact communities.
- Social relations between residents and non-residents, and between aboriginal and non-aboriginal persons.
- Programs that could support cultural patterns and cohesion.

10.2.8 Harvesting

Describe and evaluate the potential impacts of the Project, for the preferred and alternate routes, on harvesting during both construction and operation including a consideration of:

- Changes in access, including increased access to the land and surrounding lakes, as well as increased access to an environmentally and culturally sensitive area (Husky Lakes).
- Changes in the abundance and distribution of harvested resources, including wildlife, birds, fish and vegetation that would negatively affect harvesting.
- Disturbance of harvest patterns, or loss or alteration of high-value harvest areas including:
    - Changes to harvest effort as perceived by harvesters.
    - Changes in harvester travel patterns.
    - Changes in harvest levels.
    - Changes in harvesters costs.
    - Competition between harvesters within and between communities as a result of increased access and loss or alteration to the land resulting from the project.
- Changes in the quality of harvested species (including contamination) that would negatively affect their consumption or sale.
- Measures to avoid or minimize changes in the abundance, distribution, or quality of harvested species, or mitigate the consequences of such changes.
- Mechanisms to control project workforce-related hunting, fishing, or harassment of wildlife.
- Mechanisms of resource management agencies and other parties to control hunting, fishing, or harassment of wildlife by:
    - Resident hunters and fishers
    - Non-resident hunters and fishers
    - Aboriginal harvesters.

10.2.9 Land Use

Describe and evaluate the potential impacts of the Project on land use, including a consideration of:

- Various land uses, including:
  - traditional use
  - tourism and changes in tourism access
  - industrial use and changes in access.
- Patterns of use and changes in these patterns.
- Impacts on particular sites or features.

Discuss the conformity of proposed Project-related land uses with designated land use management areas as described in approved and draft management plans, community conservation plans and proposed land use designations. Identify areas of non-conformity.

Evaluate the potential impacts of the Project on protected areas and special management areas, including a consideration of the following:

- Community conservation plans.
- Regional land use plans.
- Existing and proposed protected areas.
- Special management areas.
- Other proposed special management areas such as parks, sanctuaries or preserves.
- Implementation of plans, action plans, strategies and guidelines.

10.2.10 Heritage Resources

Describe and evaluate the potential impacts of the Project on cultural heritage and special management areas, including a consideration of the following:

- Historic, archaeological, paleontological, cultural and heritage resources/ sites/ trails.
- Resource potential.
- Encounter of resources during Project activities.
- Valued visual and aesthetic locations and their attributes.

10.3 Potential Accidents and Malfunctions

The Developer shall describe and evaluate possible accidents or malfunctions, their probable and potential effects on the environment, including impacts on social, economic, and cultural elements of the environment and human health to people in close proximity of accidents or malfunctions, including spills of contaminants for the life of the Project. The Developer shall describe the process for the implementation of any mitigation measures or contingency plans. The Developer must demonstrate a commitment to having an Environmental Protection Plan (EPP) and Emergency Response Plan (ERP) that would address potential accidents and malfunctions for the life of the Project. In part, the ERP must include:

- Plans for alerting and evacuating employees during an emergency.
- Pertinent information in the case of an emergency (people in charge, equipment available, plans and maps to locate works).
- The Developer's internal emergency intervention structure and decision-making mechanisms.
- The means of communication with the external emergency preparedness organization.

- The measures considered to protect the people that could be affected.
- The means to quickly alert the people that could be affected; in collaboration with the municipal, Aboriginal and other government organizations concerned, advising public authorities of the alert and subsequent information about the situation.

Particular attention should be focused on sensitive elements of the environment that could be affected in the event of an accident or malfunction over the life of the Project, and that could potentially make the consequence worse (e.g., proximity of cabins, heritage sites or environmentally sensitive sites). The Developer should refer to the IFA and updated CCPs for guidance when considering sensitive elements in the environment in the context of the Project. Where potentially significant impacts could occur as a result of an accident or malfunction, the Developer will assess the probability of such an occurrence, taking into account weather or extreme external events that present contributing factors.

The Developer shall identify and discuss, for each Project phase, the potential accidents or malfunctions that may occur as a result of the Project, including a consideration of:

- Spills of a hazardous material (on land, ice and in water - freshwater and marine).
- Explosion and/or fire.
- Use of explosives.
- Transportation accidents (air, land, water).
- Harvesting.
- Social and cultural elements of the environment.
- Human health.

10.4 Effects of the Environment on the Project

The Developer shall consider the effects of the environment on the Project. The Developer shall describe how the Project is engineered and designed to integrate into its environmental surroundings and operate safely and reliably over its life. The Developer shall describe and discuss how physical and biological changes in the environment could have implications for the Project. This should include considerations for, at minimum, the following:

- Long-term climate change and global warming scenarios (e.g., loss of permafrost, increased evaporation and evapotranspiration, greenhouse gas (GHG) emissions).
- Short-term climatic and extreme weather events (e.g., major precipitation, wind, fog, drought).
- Seismic activity.
- Landslides and ground movement.
- Fire.

10.5 Determination of Significance

Define the appropriate approaches used to determine the significance of effects for each biophysical or socio-economic element assessed. The Developer shall also describe the impacts using criteria such as magnitude, geographic extent, duration, and frequency. The Developer shall provide justification and rationale for thresholds relating to the impacts criteria and how the impacts criteria inform the assessment about the significance of impacts.

The significance of impacts needs to be determined under the assumption that mitigation measures will be implemented successfully; hence, the significance of residual impacts needs to be determined. However, a Worst Case Scenario shall be described under which mitigation may not be as effective as expected (see Term 12.3). The Developer shall identify both positive and negative impacts.

11. Cumulative Effects Assessment

The cumulative effects of the proposed Project must be assessed. The cumulative effects assessment must demonstrate to the Review Board that any long-term cumulative effects are adequately considered and can be successfully mitigated. The analysis of the cumulative effects must enable the Review Board to gain an understanding of the incremental contribution of all projects or activities in the delineated Study Area(s), and of the Project alone, to the total cumulative effect on the VEC or VSC over the life of the Project. Cumulative impacts may occur when the impacts of one project or activity combine with the impacts of other past, present and future projects and activities.

The Developer must describe and discuss the different types of potential impacts and the EIS must include these different forms of effects, such as synergistic, additive, induced and spatial or temporal overlap. Impact pathways and trends should be included and discussed. The Developer may use linkage diagrams to help illustrate and explain impact pathways; however, this must be used as a tool to easily identify the impact pathway and not as the process for demonstrating whether impact pathways occur or not.

The Developer must identify and assess cumulative effects associated with the proposed Project and provide rationale for the process chosen to carry out the cumulative effects assessment. The approach and methods used to identify and assess cumulative effects must be explained. For all aspects of the Project under consideration, including alternative routes, the Developer will identify and justify the environmental and socio-economic elements (VECs or VSCs), including Inuvialuit harvesting, that will constitute the focus of the cumulative effects assessment. The Developer must provide rationale and justification for the elements assessed. The Developer must identify and assess the cumulative environmental and socio-economic effects of the project in combination with other past, present or reasonably foreseeable projects and/or activities within the Study Area(s).

The assessment of cumulative effects of the project must include the following, but may also address other items:

- Identify the VECs and VSCs, or their indicators, on which the cumulative effects assessment is focused, including the rationale for their selection. Present spatial and temporal boundaries for the cumulative effect assessment for each VEC selected. Emphasize VECs with special environmental sensitivities or where significant risks could be involved.
- Identify the sources of potential cumulative effects. Specify other projects or activities that have been or will be carried out that could produce effects on each selected VEC or VSC within the boundaries defined, and whose effects would act in combination with the residual effects of the project.
- Evaluate the likelihood of development by the Proponent or others that may appear feasible because of the proximity of the Project's infrastructure. Limit assessment to cumulative effects on the physical, biological, and human environments that are likely and for which measurable or detectable residual effects are predicted.

A reasonable degree of certainty should exist that the proposed projects and activities will actually proceed for them to be included. Projects and activities that are conceptual in nature or limited as to available information may be insufficiently developed to contribute to this assessment in a meaningful manner. In either case, provide a rationale for inclusion or exclusion.

The Developer must describe the analysis of the total cumulative effect on a VEC or VSC over the lifespan of the Project, which requires knowledge of the incremental contribution of all projects and activities, in addition to that of the Project.

Potential effects on a VEC are not necessarily the result of one project. While a project-specific assessment of cumulative effects is not responsible for assessing all external effects; the effect assessment must consider how a project-specific effect, or suite of project-specific effects, would interact with these external factors.

The Cumulative Effects Assessment must make clear the contribution of the project to a total potential cumulative effect, and place potential cumulative project effects in an appropriate regional context, considering regional plans, community conservation plans, species recovery plans, management plans, objectives and/or guidelines in an integrated manner in order to understand the aspirations of people and communities in the region.

In assessing the cumulative environmental effects of this Project in combination with other projects and/or activities, the Developer shall identify any changes in the original environmental effects and significance predictions for the project. The Developer shall also discuss the effectiveness of the proposed mitigation and/or other restitution measures and the response to such changes, as well as the implications for monitoring and follow-up programs as described in Term 13.

The Developer shall address and/or provide rationale for the following in any cumulative effects assessment:

- Geographic and temporal boundaries for the cumulative effects assessment;
- Loss of remoteness.
- Direct and indirect disturbance of land or land change outside of the direct footprint of the development as a result of the proposed Project.
- The approach of the assessment in the context of the IFA and updated CCPs.

The Developer shall outline, in detail, the proposed management tool(s) for cumulative effects resulting from the proposed Project.

The Developer shall also provide a discussion of potential induced effects of future developments that could occur as a result of, or could occur and use, this highway (e.g., Mackenzie Gas project, other oil and gas activities). Include a discussion of long-term operation, maintenance and management of the highway.

12. Mitigation, Mitigative and Remedial Measures, and Worst Case Scenario

A fundamental goal of the EIRB as set out in the IFA is to consider a probable scenario as a legitimate test by which to judge whether negative impacts to wildlife, wildlife habitat and wildlife harvesting can be minimized to acceptable levels by mitigative and remedial measures. With respect to the estimate of the Developer's potential liability, the IFA states that liability should be determined on a "worst case scenario, taking into consideration the balance of economic factors, including the ability of the Developer to pay, and environmental factors."[2]

This chapter looks at all mitigation measures identified during the impact assessment, and also looks specifically at development impacts that could affect wildlife harvesting, and the development of a worst case scenario for potential compensation purposes. Some of the information presented here may be the same as what was presented in previous chapters. Where appropriate, references can be made to the information in other chapters; however, the discussion and conclusions reached in this chapter are necessary to address the specific requirements of the IFA.

12.1 Mitigation

The Developer shall include a discussion of the details of, and how it proposes to implement, all mitigation measures proposed to reduce or eliminate environmental impacts, and provide a table summarizing all proposed mitigation measures on the impacts to all VCs identified in the impact assessment. These will be considered by the EIRB as commitments of the Developer.

12.2 Mitigative and Remedial Measures

This section provides direction to the Developer on developing mitigative and remedial measures to minimize negative impacts to wildlife, wildlife habitat and wildlife harvesting. The Developer shall clearly identify mitigative and remedial measures designed to reduce or eliminate negative impact to wildlife, wildlife habitat and wildlife harvesting in the EIS.

12.2.1 Defining Mitigative and Remedial Measures

Mitigative and remedial measures are generally limited in their intended application to those harvested species in the ISR that may be affected by development. Certain species which are not likely to be harvested, but are deemed "important" in an ecological, or other social context, are also included. Federal or territorial designated species at risk are an example of this latter category.

Sustainable development is the overriding principle guiding the preparation of the mitigative and remedial measures. 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." All land uses shall be conducted in keeping with the policy of sustainable development in order to protect the opportunities for wildlife harvesting.

[2] *Subsection 13(11)(b)*

There is a recognized sequence to the application of these measures:

Mitigation *A priori* (looking at causes) efforts to prevent or lessen potential adverse environmental effects that may occur.

Remediation *A posteriori* (looking at effects) efforts to correct or compensate for any adverse environmental effects that have occurred, and to prevent, lessen, or compensate for any adverse environmental effects that may occur in the future as a result of the environmental damage.

Thus mitigative measures would include design, location, operational processes, timing and the preparation of contingency plans (including countermeasure plans). Remedial measures would include the implementation of contingency plans, restoration of wildlife and wildlife habitat, and compensation.

12.2.2 What Developers Shall Consider

To properly address the requirement for mitigative and remedial measures the EIS shall include:

- A description of any potential impacts to the biophysical and human environment, wildlife, wildlife habitat, and wildlife harvesting activities.
- A description of the proposed mitigation to reduce or eliminate potential impacts.
- Clearly identify mitigation measures to address sensory disturbances to wildlife, particularly barren ground caribou and grizzly bear.
- An outline of emergency response plans and any management and monitoring plans proposed and/or required for the development to proceed (e.g., clean-up, reclamation, disposal, decommissioning, contingency, wildlife management, adaptive management, follow-up and monitoring).
- Where appropriate, a clear indication of the party responsible for implementing the mitigation.

Mitigation measures to be used to reduce the potential negative effects of a development should also be identified. Measures that are built into the design of the development can be included in the discussion of development activities. For example, all land users shall avoid harm to wildlife and wildlife habitat and damage to community travel routes through the timing of their operations, through careful selection of the location of their main camps and travel routes and through other mitigative measures. Descriptions of mitigative measures should be specific (i.e., mitigative measures that require actions or responses by the Developer should be explicitly identified and explained), and should include a rationale for use and examples of where these measures have been used effectively.

Such measures may include:

- Mandatory restrictions imposed by laws of general application, regulations and guidelines. Laws of general application include territorial or federal statutes which are justified for conservation or public safety reasons such as the NWT's *Wildlife Act*, the *Criminal Code of Canada,* the *Fisheries Act,* the *Migratory Birds Convention Act* and the Migratory Bird Regulations.
- Voluntary measures taken by the Developer (e.g., to use a different technology, to change the timing of activity or to commit to suspending activities in certain circumstances).
- Attachment of terms and conditions to specific authorizations that are required and that can be enforced, such as under the *National Parks Act*, or *Species At Risk Act,*
- Regional mitigation measures (e.g., Beaufort Sea Beluga Management Plan, Barren Ground Caribou Management Strategy for the NWT, Yukon North Slope Wildlife and Conservation Plan,

CCP's, Marine Protected Areas, Herschel Island Management Plan, Ivvavik National Park Management Plan) that were considered and will be implemented by the Developer.

Where measures within access or benefit agreements, or socio-economic agreements and environmental agreements will be relied upon as a mitigative measure, provide the following information:

- The impacts which will be mitigated.
- A general description of the mitigation measure(s).
- The parties to the agreement.
- An overview of implementation and monitoring plans for any such agreement.

It is recognized by the EIRB that some of these agreements may be confidential, and this information should be used appropriately by the Developer.

12.2.3 What the EIRB Recommends

The EIRB is required to recommend terms and conditions relating to the mitigative and remedial measures that it considers necessary to minimize any negative impact on present and future wildlife harvesting.

Where a proposal is referred to the Review Board, and if the Review Board recommends that the proposed development should proceed, then terms and conditions relating to the mitigative and remedial measures considered necessary to minimize any negative impact on wildlife harvesting will be recommended[3]. The EIRB is also required to provide an estimate of the potential liability of the Developer[4].

While the EIRB is required to provide recommendations on certain aspects of any proposed development, the factors which the EIRB should consider in reaching its conclusions are not set out. Recommendations brought forth by the EIRB are based on the principle to protect and preserve the Arctic wildlife, environment and biological productivity and the objectives set forth in the IFA[5]: "to prevent damage to wildlife and its habitat and to avoid disruption of Inuvialuit harvesting activities by reason of development" and "if damage occurs, to restore wildlife and its habitat as far as is practicable to its original state and to compensate Inuvialuit hunters, trappers and fishermen for the loss of their subsistence or commercial harvesting opportunities."

Mitigative and remedial measures would include the implementation of contingency plans, restoration of wildlife and wildlife habitat, and compensation. Wildlife restoration options include restocking wildlife populations and habitat enhancement.

12.3 Worst Case Scenario

This section provides direction to a Developer for preparing a *worst case scenario* for negative impacts to wildlife, wildlife habitat and wildlife harvesting. The Developer shall provide a worst case scenario estimate for its proposed development.

[3] *Subsection 13(11)(a)*
[4] *Subsection 13(11)(b)*
[5] *Subsection 13(1)*

12.3.1 Wildlife Compensation

The Inuvialuit have expressed concern that the environment be protected as it is essential to the maintenance of healthy wildlife populations, especially terrestrial and marine mammals, fresh and saltwater fish, and their habitats. Healthy wildlife populations remain vital to Inuit social, cultural and economic well-being. Respecting actual wildlife harvest loss, Inuvialuit who harvest renewable resources for subsistence purposes or who depend on hunting, trapping or fishing for a material part of their gross income have the right to obtain compensation for damage to or loss of harvesting equipment, for any material reduction in wildlife take or harvest, and for loss or reduction of hunting, trapping or fishing income.

Section 13 of the IFA identifies a wildlife compensation and liability regime for damages resulting from development:

> Subsection 13(1):
> The objectives of this section are:
>
> a) to prevent damage to wildlife and its habitat and to avoid disruption of Inuvialuit harvesting activities by reason of development; and
> b) if damage occurs, to restore wildlife and its habitat as far as is practicable to its original state and to compensate Inuvialuit hunters, trappers and fishermen for the loss of their subsistence or commercial harvesting opportunities.

The Inuvialuit "shall be compensated for actual wildlife harvest loss resulting from development in the Inuvialuit Settlement Region"[6], and "shall benefit from environmental protection measures designed to reduce future harvest loss resulting from development in the [ISR]"[7].

Use existing IHS and other sources of available data (e.g., from HTCs and government) to quantify compensation claims.

The types of compensation that may be claimed include:

- Relocation of harvest activity. Most desirable but other areas may not have surplus stock.
- Reimbursement in kind. It may be difficult to acquire country foods in sufficient quantities over the long term.
- Direct cash compensation. May be an option when relocation of harvest activity and reimbursement are impractical.

12.3.2 Liability and Worst Case Scenario

With respect to the estimate of the Developer's potential liability, the IFA says that it should be determined on a "worst case scenario"[8]. If there is a possibility that damage to wildlife or wildlife habitat may occur, the EIRB must recommend terms and conditions relating to mitigative and remedial measures that are necessary to minimize the negative impact of a proposed development on wildlife harvesting[9]. If damage does occur, the IFA provides for restoration of wildlife and its habitat, as well as compensation to

[6] *Subsection 13(3)*
[7] *Subsection 13(4)*
[8] *Subsection 13(11)(b)*
[9] *Subsection 13(11)(a)*

the Inuvialuit for lost harvesting opportunities. Since compensation is payable for loss of actual wildlife harvest loss or future harvest loss legal liability provision of the IFA[10], the EIRB is required to estimate the potential liability of the Developer based on a worst case scenario. The IFA requires the EIRB to recommend, to the government authority empowered to approve the proposed development, an estimate of the potential liability of the Developer[11], "taking into consideration the balance between economic factors, including the ability of the Developer to pay, and environmental factors."[12] The Worst Case Scenario will be used to calculate a security amount to be held by the federal Minister.

As set out in the IFA, "[w]here it is established that actual wildlife harvest loss or future harvest loss was caused by development, the liability of the Developer shall be absolute and he shall be liable without proof of fault or negligence for compensation to the Inuvialuit and for the cost of mitigative and remedial measures" detailed in s. 13(15).[13] Under s. 13(16), if any Developer "fails to meet his responsibilities" for actual or future harvest loss, Canada, "where it was involved in establishing terms and conditions for the development, has a responsibility to assume the Developer's liability for mitigative and remedial damages to the extent practicable."[14] This means that a federal agency or regulatory authority would be responsible for site cleanup and restoration.

12.3.3 Examples of Previously Defined "Worst Case Scenarios"

Driftwood Salvage Logging Operation

An application was submitted for a driftwood salvage logging operation along the Yukon's North Slope, and an ice-road from Inuvik to King Point in support of a sawmill to be located at or near Inuvik. There was the possibility of some wildlife loss as a result of driftwood salvage logging operations, and the Developer proposed the threat to denning polar bears as the "worst case scenario". Even with proper mitigative measures there remained a possibility that the worst case scenario would occur and there would be polar bear losses caused by the Development. It was the Panel's opinion that the loss of three polar bears, a female and two cubs, was a reasonable estimate of the maximum extent of polar bear losses. The Panel believed that the loss of each polar bear could represent a loss of up to $20,000 to Inuvialuit hunters. This was based on the value of a sport hunt to these hunters. The Panel, therefore, recommended that the Developer maintain a $60,000 letter of credit in favour of the IGC as security for present and future wildlife harvest losses.

Seismic Surveys in the Mackenzie Delta

An application was submitted to conduct a seismic survey under sections of the Middle Channel, Reindeer Channel and East Channel of the Mackenzie River in August and September. A tug would be used to tow the airgun array. The Developer proposed a worst case scenario in its EIS, whereby a work barge would accidentally ground itself and spill its diesel fuel. The accidental grounding and fuel spill would result in residents avoiding consuming fish from the river because of the perception that the fuel would taint the fish, and the loss of harvesting of whitefish and inconnu during August and September and for the remainder of that fishing season. IHS data for Aklavik, Tuktoyaktuk and Inuvik indicated average annual broad whitefish and innconu harvest levels over the period of 1995-2000, for the period of August to December, were 10,776 and 2,358 fish, respectively. The Panel estimated that should the worst case scenario come to pass, the fish harvesting loss for the Inuvialuit for broad whitefish and inconnu would be $328,350 [(10,776 + 2,358) x $25 per fish]. Based on the evidence of insurance provided by the

[10] *Subsection 13(15)*
[11] *Subsection 13(11)*
[12] *Subsection 13(11)(b)*
[13] *Subsection 13(15)*
[14] *Subsection 13(16)*

Developer, the Panel accepted that the Developer would have the ability to compensate for actual or future wildlife harvest loss should the worst case scenario take place.

12.3.4 Wildlife Habitat Restoration

Restoration includes post-development measures that would enhance recovery of harvested populations to pre-development levels. Determining the practicality and potential costs of restoration resulting from a "worst case scenario" requires:

- Identifying valued wildlife species. Valued wildlife species are limited to those harvested species of the ISR that may be affected by a development.
- Assessing wildlife species vulnerability and sensitivity to development. Vulnerability refers to the likelihood of key habitat being impacted and sensitivity refers to response at a population level (short-term or long-term) based on reproductive capacity.
- Evaluating the practicality of wildlife and wildlife habitat restoration options. Some options include relocation, restocking, cleaning and treatment of contaminated wildlife, enhancement of productive capacity of wildlife habitat, and harvest restrictions.
- Estimating the cost of implementing practical treatments. The cost estimation will be driven by evaluating the level of effort needed to ensure recovery of the wildlife population at a regional level.

13. Follow-up and Monitoring

"Follow-up", as defined in section 1.2 of this document, means a program for verifying the accuracy of the environmental assessment of a project, and determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project. The Developer shall:

- Clearly describe the regulatory and non-regulatory monitoring requirements for the life of the project.
- Provide a description of the purpose of each program, responsibilities for data collection, analysis and dissemination, and how results will be used in an adaptive management process.
- Describe how project-specific monitoring will be compatible with the NWT Cumulative Impact Monitoring Program or other regional monitoring and research programs.

13.1 Environmental and Socio-Economic Effects Monitoring

Measuring the effectiveness of mitigation, which includes reclamation, requires that both the baseline and the future effects can be quantified. The effectiveness of mitigation measures can only be determined by a monitoring approach that is based on testable or answerable questions, and includes adequate sampling and statistical procedures. To the extent possible, the Developer should present data in the EIS that may be used for a baseline or benchmark in setting targets, thereby providing the foundation needed in the future to demonstrate the effectiveness of mitigation measures. Where the Developer does not present such data for bench marks and targets, the Developer shall commit to a schedule and a process by which such data will be provided and used in the development of follow-up and monitoring targets. The targets shall be used in defining the expected success of mitigation. As not all socio-economic indicators or data are conducive to measurement using targets, the Developer should clearly state where qualitative and quantitative goals are used in place of targets.

The Developer shall prepare a table with effects monitoring requirements. For each effect of concern, this table shall include, at a minimum, information on what the indicators and the parameters for the measurement will be and what the target or management goal will be.

13.2 Compliance Monitoring

The concept of effects monitoring is different from compliance monitoring or inspection. The intent of compliance monitoring is to assure that the terms and conditions set out in regulatory approvals, licences and permits, and in the commitments submitted by the Developer, will be adhered to and met. As part of compliance monitoring, an environmental inspector shall inspect project activities during construction to ensure work is conducted in accordance with all applicable regulations, commitments and mitigation measures. The inspector shall ensure that project activities meet the conditions of any applicable permits, licences and approvals that are obtained following regulatory review of the project.

The Developer shall prepare a table with inspection requirements. This table will be updated throughout the life of the project to reflect the current conditions of any applicable permits, licences and approvals. This table shall include, at a minimum, information on what inspection activity will be taken and how frequently and during which period the inspection will occur.

13.3 Environmental Management Plans

The Developer shall submit environmental management plans for specific areas of concern it feels are appropriate to ensure the environmental goals set out in Table 1 are being achieved as well as possible over the life of the project. The Environmental Management Plans shall provide the detail necessary to understand the methods for the implementation of mitigation measures, the methods for the monitoring of mitigation effectiveness (also see Term 12), and a reporting mechanism on how well the Table 1 goals

are being achieved. Environmental Management Plans shall include those plans identified by the Developer in the EIS as being required (e.g., management plans for dust, wildlife, adaptive management) and other plans deemed necessary.

13.4 Socio-economic and Cultural Effects Management, Policies, and Commitments

Describe any management plans, policies, commitments, and arrangements directed at promoting beneficial or mitigating negative impacts to social, cultural, or economic conditions where they have been presented as a form of mitigation.

Discuss any requirements for contractors and sub-contractors to comply with these policies. Include information on the following:

- Recruitment, training, hiring, pay equity and employment policies, including those policies specifically for Aboriginal and local candidates, and those promoting participation.
- Contracting and procurement policies, including those which promote local sourcing, and participation of local businesses and how this will be accomplished.
- Employment policies, including policies on alcohol and drugs on the job site, harassment policies, firearms policies, work and pay schedules, and any policies related to worker access to harvesting areas.
- Commuting and work rotation of workers and contractors.
- Policies to managing hunting, fishing and gathering on, or from, the work site by non-Inuvialuit employees and contractors, while respecting the harvest rights of Aboriginal employees and contractors.
- Occupational health and safety and related training, and emergency response plans for workplace accidents.
- Scheduling of construction activities to accommodate needs of Aboriginal harvesters (employees, contractors, and non-employees).
- Scheduling of work activities to accommodate needs of Aboriginal employees and contractors to pursue other traditional activities.
- Promoting activities and programs that increase community stability and wellness.

14. References

The Developer shall provide all references, information, and guidance sources used in the preparation of the EIS. This shall include primary, peer-reviewed literature, government and consulting reports, personal communications, guidelines and best practices. The EIRB may request copies of references for consideration in its deliberations.

Appendix A

Biophysical Baseline Information Requirements

Terrain, Geology, Soils and Permafrost

Describe the existing terrain, geology, soils and permafrost in the Project Study Area(s), including a description, location, and geographic extent of the following features:

Regional/area setting, topography and geological, including key terrain features such as rivers, lakes and wetlands and other important processes and features.

Bedrock and Subsurface Conditions:

- bedrock type and depth
- subsurface formations that may be used for Project-related disposal and their hydrogeological conditions

Surficial Materials and Soils:

- unconsolidated surficial materials and terrain types, including thickness
- landforms
- soil types, including group, series and type, as applicable

Physical, thermal, mechanical and geotechnical properties of surficial materials and bedrock, where applicable:

Borrow Materials:

- locations
- type of material
- size and depth of deposit
- permafrost conditions and ice content within deposits
- quantity and quality
- ownership and availability

Permafrost:

Provide a description of permafrost and ice-rich soils in the Project area, including:

- distribution (thickness and lateral extent) on land, water, shoreline and slope crossings, including a discussion of taliks
- permafrost processes, features and landforms and their stability, including slopes, shorelines and stream banks
- frozen/unfrozen interfaces (i.e., frequency, length of segments)
- ground ice conditions (massive and other forms) and ice content
- temperature and ground thermal regime (both frozen and unfrozen ground)
- active layer thickness
- seasonal frost penetration in unfrozen ground
- thaw sensitivity
- frost susceptibility of unfrozen and frozen ground
- how fires affect ground temperature regimes and permafrost
- describe pingos and thaw slumps in the project area
- demonstrate an understanding of regional climate warming and documented warming of ground temperatures in the region

- describe how warming ground temperatures and deepening active layers will affect the highway and how mitigation measures will remain effective in various climate warming scenarios.

Describe existing spatial and temporal trends related to the distribution and characteristics of permafrost in the Project area. The use of maps and diagrams is highly encouraged.

Areas of geotechnical and geological instability, geological hazards and seismicity, including:

- landscape processes and areas of occurrence, such as landslides, mudflows, creep, slumping and debris flows;
- karst
- fault zones
- active seismic areas
- areas susceptible to water, ice or wind erosion and scour
- fluvial geomorphology, including stability of floodplains and channel bottoms
- the sources of information and any classification systems relied upon must be referenced and, as necessary, described to assist in understanding the information provided

Climate

Provide a description of the existing or baseline climate conditions and climatic variability and trends, including, but not necessarily limited to:

- the location of recording stations and length of record for any meteorological data presented
- prevailing climatic conditions, seasonal variations, predominant winds including direction and velocity, temperature and precipitation (snowfall, snow depth, rain, fog, wind)
- spatial and temporal boundaries for the description of climate
- any current climate-related extreme events that may affect the Project, and frequency of occurrence

In support of the baseline description:

- identify the spatial boundaries for the description of climate conditions (e.g., any regional scale(s))
- define the ‘current’ climate normal period (baseline period) relied upon and describe how it was determined
- define the variability/trends within the ‘current’ climate normal period and within the historical period of instrumental record
- discuss the contribution of traditional knowledge to the understanding of climate conditions and variability
- identify any guidelines followed when describing the baseline period
- identify the location of recording stations and length of record for any meteorological data presented
- identify any synthetic climate data generated for the purposes of establishing the baseline climate conditions and describe the models used to generate this information

Changes in climate, in terms of direction, magnitude and climate element affected, can be expected to vary at a regional scale. Accordingly, the description of baseline conditions should be presented in a manner that reflects this variability and facilitates subsequent discussion of how changes in climate could change the Project, or particular Project components. If using Inuvik and Tuktoyaktuk climate data,

describe how it will be generalized for the entire project area, and identify the spatial boundary between the two datasets.

Air Quality

Provide a description of the existing air quality in the Project area, including:

- the spatial boundaries of the airsheds within which the Project would be located, including a rationale for their delineation
- for each airshed, identify current sources of emissions, seasonal variations, climatic conditions affecting air quality (e.g., wind direction and velocity) and, if known, assimilative capacity
- the existing and historic air quality in each airshed, based upon, but not limited to, parameters identified in territorial, federal or other relevant air quality standards and objectives
- visibility
- the recording stations and length of record for any air quality data presented

Noise

Describe the local, regional, historic and ambient noise levels in the context of the Study Area(s) and along the proposed Project route locations. If noise levels are described at certain specific Project locations along the proposed route alternatives, provide rationale for their selection. Further, at these sites, describe:

- existing noise sources, including duration, frequency and levels of noise
- the sources and types of variation in existing noise levels
- any relevant standards, guidelines or objectives with respect to noise levels
- the spatial boundaries of existing noise levels
- identify recording stations and length of record for any noise data presented

Water Quality and Quantity

Provide a description and maps of the existing water resources within or near the boundaries of the Study Area(s) including:

- waterbodies, watercourses and major drainage areas
- watercourses that have year-round flow
- the extent of connectivity to adjacent watercourses including any potential seasonal variation
- seasonal and perennial springs including ephemeral streams located within or near the boundaries of the study area(s)
- naturally occurring icings
- describe the recharge ability of lakes that will be used for winter road watering or ice mining

Provide a description of major drainages and watercourses, including the basis for their selection. For each major drainage or major watercourse, as appropriate, provide a description of it hydrological characteristics, including:

- flow regimes
- variability and sources of variability

- seasonal flow patterns
- channel and bed morphology and stability
- sediment load – suspended and bed load
- active and historical floodplains
- freeze/thaw timing
- taliks/permafrost distribution and stability beneath waterbodies
- the role of wetlands (e.g., bogs, fens and peat plateaus)

In the vicinity of communities and along Project routes being considered, describe:

- flood regimes
- ice-jamming and scour

In each major drainage, identify locations of existing and planned water use (domestic, municipal, camp, etc) in relation to the proposed Project routes. For each area of water use that may be affected by the Project, identify:

- quantity of use
- existing water quality, including relevant federal, provincial and territorial guidelines, criteria and legislation
- seasonal or other temporal variation of water quality and use
- existing sources of water quality impairment and their locations in relation to Project routes alternatives

Provide a description and maps of existing groundwater resources within the Project Study Area(s), including:

- quality and quantity
- hydrogeological conditions, including depth, flow patterns, recharge and discharge areas
- existing and planned water usage

Discuss hydrogeological conditions in near-surface materials or deeper formations, where relevant to proposed Project routes, components and activities.

Fish and Fish Habitat

Provide a description of the existing fish and fish habitat within the Project area, including:

- a description of fish habitat present at each of the planned water crossings, including references (such as photographs and diagrams) at those locations
- fish species including forage fish (non-harvested) and any other aquatic resources of value present
- seasonal and life cycle movements and sensitive periods
- habitat requirements for each life stage
- local and regional abundance, distribution and use of habitat types, including aquatic and riparian vegetation
- known sensitive or important areas in terms of habitat type (e.g., spawning, overwintering, refugia, feeding), species and timing of use
- for species of concern (see Term 10.1.5), also describe specific location, population status, limits and size, sensitivity and limiting factors
- baseline contaminant concentrations in harvested species, that may change as a result of the Project and as available

- any known issues with respect to health of harvested species (e.g. parasites, disease, condition)
- species of particular importance to subsistence harvesters
- species subject to exclusive or preferential rights granted by land claims
- species of particular importance to the guiding or outfitting industries
- areas subject to exclusive harvesting rights granted to land claim beneficiaries
- harvest pressures (subsistence, sport fishing and commercial harvesting) by species, season and geographic area
- listing of existing non-native species

Wildlife and Wildlife Habitat

Provide a description of the existing wildlife and wildlife habitat within the Study Area(s), including:

- wildlife species present
- distribution and abundance, seasonal movements, habitat requirements (e.g., breeding, calving, feeding) and sensitive time periods
- for species of concern (see Term 10.1.5), also describe specific location(s), population status and trends, limits and size, critical habitat, sensitivity and any other limiting factors
- species subject to exclusive or preferential rights granted by land claims
- species of particular importance to the guiding or outfitting industries
- habitat types including local and regional distribution and abundance
- species of importance to subsistence harvesters
- habitat or sites of special value or sensitivity, including species use and timing
- areas subject to exclusive harvesting rights granted to land claim beneficiaries
- migratory patterns, routes and timing in relation to Project route alternatives, construction activities, and operation
- harvest pressures (subsistence, resident and non-resident harvesting and commercial harvesting) by species, season and geographic area
- listing and location(s) of existing non-native species
- current and historic levels of natural and human-caused fragmentation and connectivity
- baseline contaminant concentrations in harvested species, that may change as a result of the Project
- any known issues with respect to the health of harvested species (e.g. parasites, diseases, condition)

Birds and Bird Habitat

Provide a description of the existing bird resources with the Project area, including:

- bird species present
- abundance and distribution, seasonal movements, habitat requirements (breeding, moulting, staging, feeding) and sensitive periods
- for species of concern (see Term 10.1.5), also describe specific location(s), population status and trends, limits and size, critical habitat, sensitivity and limiting factors status and trends;
- species subject to exclusive or preferential rights granted by land claims
- habitat types including local and regional abundance and distribution
- baseline contaminant concentrations in harvested species, that may change as a result of the Project
- any known issues with respect to health of harvested species (e.g. parasites, diseases, condition)
- areas subject to exclusive harvesting rights granted to land claim beneficiaries
- species of particular importance to subsistence harvesters

- habitat or sites of special value or sensitivity, including species use and timing
- harvest pressures (subsistence and sport hunting) by species, season and geographic area
- listing and location(s) of existing non-native species

Vegetation

Provide a description and maps of the existing vegetation in the Project area, including:

- vegetation and vegetation assemblages
- any classification system followed, as appropriate
- identification of species or assemblages that are rare, valued, protected or designated (e.g., vulnerable, threatened, endangered)
- for species of concern (see Term 10.1.5), also describe specific location, population status, limits and size, sensitivity and limiting factors
- historic and current human use of vegetation, including subsistence and commercial harvesting, (e.g., berry picking, forestry)
- baseline contaminant concentrations in harvested species or vegetation (e.g. berries) that may change as a result of the Project and as available
- locations and quantities of merchantable timber
- listing and location(s) of existing non-native species
- frequency of forest and tundra fire
- post-fire vegetation succession, if applicable

Table 2 Biological, Physical, and Human Elements and Goal Statements

Element	Goal Statements
Migratory Birds and Habitat	Protect and avoid disturbance or destruction to migratory birds and their habitat throughout all phases of the proposed development.
Species at Risk	Avoid the loss, damage or destruction of species at risk and their critical habitat throughout all phases of the proposed development.
Wildlife and Wildlife Habitat	Protect all wildlife and wildlife habitat and minimize habitat losses throughout all phases of the proposed development.
Fish and Fish Habitat	Protect all fish and fish habitat and establish a “no-net-loss” of fish habitat throughout all phases of the proposed development.
Vegetation	Maintain the diversity of all vegetation communities throughout all phases of the proposed development.
Water bodies and Wetlands	Conserve and minimize or avoid negative impacts to all water bodies and wetlands throughout all phases of the proposed development.
Soil	Protect and sustain soils and minimize losses through erosion throughout all phases of the proposed development
Surface water and Groundwater	Protect or minimize impacts to all ground and surface water throughout all phases of the proposed development.
Permafrost	Protect and minimize impacts to permafrost throughout all phases of the proposed development.
Noise	Minimize anthropogenic noises throughout the duration of the proposed development.
Climate Change	Minimize contributions to climate change throughout all phases of the proposed development.
Air Quality	Minimize air pollution throughout all phases of the proposed development.
Navigation	Avoid impeding navigation throughout all phases of development.
Wildlife Harvesting	Conserve species used for wildlife harvesting throughout all phases of the proposed development.
Culture, Heritage and Archaeology	Preserve culture, heritage and archaeology throughout all phases of development.
Communities	Minimize or avoid negative impacts to local communities throughout all phases of the proposed development
Economy	Pursue economic development opportunities that do not adversely impact environmental, social, and cultural conditions/wellness
Human Health and Safety	Avoid negative impacts to human health and safety throughout all phases of development
Land Use	Protect important land use areas.
Participation Agreement (IBA) if required	Commitment from the Developer to participate (section 10 of the IFA.)
Other elements required by the EIRB, or identified as important by the Developer	TBD; and as defined in the EIS Terms of the Terms of Reference.

Appendix B

Human Environment Baseline Information Requirements

Demographics

Provide a description of the social and demographic profile(s) and trends in the area of the Project, including the following:

- population and population trends by community and by region
- number of persons per household and number of households
- age and gender
- ethnicity
- births, teen births and deaths
- in/out migration by community and region, and factors that could contribute to migration patterns

Regional and Local Economies

Provide a description of the local and regional economies and their performance, including:

- national, provincial, and territorial gross domestic product (GDP)
- employment rate (including part-time, full-time, seasonal, and self-employment)
- employment by industry and occupation, including occupations related to traditional activities
- employment by age, gender, and ethnicity
- job vacancy and unfilled positions
- labour force growth
- labour force participation and labour force balance between wage and non-wage sector activities
- income and income balance from all sources on a household and per capita basis
- earnings growth
- annual level of social assistance benefits on a household and per capita basis
- annual level of social assistance recipients
- poverty levels
- local consumer prices and cost of living, particularly with respect to food, fuel, utilities, transportation, housing, affordable housing
- level of local households consuming harvested meat and fish
- current status of the renewable resource sector and related harvest activities, and the factors that affect them
- current and projected land-based enterprises and economic activities, including those related to tourism, outfitting, commercial harvesting, recreation, renewable and non-renewable resources
- number of licensed businesses
- number of licenses businesses by Inuvialuit ownership and gender
- local and regional economic development goals and objectives as identified in public consultations, the Inuvialuit Final Agreement (IFA), Community Conservation Plans (CCPs)

Education, Training and Skills

Provide a description of the education, skills and training levels in the communities relevant to the Project, including:

- graduation and achievement rates including high school or higher
- trade certification levels

- education, training and skill levels as these relate to existing employment patterns and opportunities
- adult basic education and literacy programs

Identify education, training and/or certification programs and institutions available within the region to residents of the Project area.

Describe the timing and duration of education and skills development programs that would be required for Project-related employment.

Infrastructure and Institutional Capacity

Describe the local and regional infrastructure and institutions, including:

- the role of different orders of government (federal, territorial, provincial, local, aboriginal) in providing financing, public services and maintaining local and regional organizations and infrastructure that may be impacted by the Project
- status of community and local government institutions and organizations, including their powers, responsibility, financing and fiscal capacity
- current levels of use of existing social, institutional, family, health and community services and local, regional and territorial infrastructure and the capacity of these to meet current, additional and new needs. Particular attention shall be given to:
    - health facilities and services, including medivac
    - emergency response and law enforcement services
    - waste disposal and management
    - water and sewage facilities
    - power and fuel services
    - transportation systems (barging, roads, airports)
    - telephone/ communication service
    - fire protection
    - housing stock, costs and availability
    - safe houses and shelters
    - child care and elder care services
    - schools and education facilities
    - recreational facilities
    - management of renewable resources
    - supply of aggregate and granular materials
    - planned major capital projects or planned major social or institutional changes in the Project area

Human Health and Community Wellness

Provide a description of the status of human health and community wellness in the area of the Project, including:

- the physical, mental and social health of residents of the areas affected by the Project, based on local perceptions of health and well-being and quantitative indicators, where available, that include:
    - mortality and morbidity
    - relevant diseases, both non-communicable (i.e. diabetes) and infectious diseases
    - children's health, including infant mortality and dental health

    - nutrition (e.g., the availability and significance of traditional and country foods as well as store-bought food sources)
    - indicators of personal health practices such as smoking rates and levels of physical activity
    - social pathology or dysfunction (e.g., family violence; suicide, family violence, crime rates)
    - alcohol, drug and other substance abuse
    - sexual health, including sexually transmitted infections and teen pregnancies
    - homelessness and poverty
- support systems and programs available regionally and locally to address human health and community wellness (e.g., health services, elder care, child care, counseling, alcohol and drug treatment, healing centres)
- age, gender and ethnicity

This description of health status should include indicators of determinants of health, including physical, social, cultural and economic aspects.

Socio-cultural Patterns

Describe socio-cultural patterns and social organization in the communities in the Project area to assist in understanding social stability and cohesion, including:

- cultural and spiritual life of the communities, including language
- patterns of family and community life, such as community and household social organization, including the organization of work, both paid and unpaid, and its distribution between men and women, and the patterns of sharing and mutual aid
- participation in traditional activities, by age and gender
- social relations between residents and non-residents, between men and women, among generations and between aboriginal and non-aboriginal persons
- support systems and programs available regionally and locally to address social and cultural development issues

Harvesting

Provide a description of current and traditional harvesting, focusing on subsistence and commercial harvesting, including:

- harvesting activities and other traditional uses by Inuvialuit within areas affected by the Project, including:
    - the contribution from subsistence, sport, and commercial harvesting to the household and community economy
    - current resource accessibility and quality for harvesters
    - level of harvests
    - level of participation in harvesting activities for household food supply
    - location of harvest areas, with specific attention to (1) areas where exclusive or preferential harvesting rights are granted by the IFA, (2) high use areas, (3) areas of sensitivity, and seasonal access
    - recent and current encroachments and restrictions of harvesting activities (i.e. by competing uses of land and resources or related regulations)
- outfitting and trapping activities and related use areas (active and fallow)

Land Use

Describe traditional and current land use patterns, designations and special management areas in the Project area, including:

- land uses, including but not limited to the following:
    - traditional use areas
    - special harvesting sites
    - traditional trails
    - seasonal and permanent camp areas (i.e., individual work, recreational, commercial)
    - parks and recreation areas
    - transportation corridors
    - granular resources
    - industrial zones
- land use designations, including but not limited to the following:
    - land management categories according to Community Conservation Plans
    - protected areas
    - areas of high conservation value/ecological sensitivity
    - ecologically important areas
    - caribou protection measures
- valued aesthetic locations and their attributes
- lands and features of special interest or value, and their attributes

Heritage Resources

Describe the existing archaeological, palaeontological, and historic resources, collectively referred to here as heritage resources, within the Project area. Include:

- archaeological, paleontological and historic sites and resources
- culturally important sites
- burial sites
- heritage resource potential