

4 mars 2004

Ébauche du cadre de référence pour l'étude des effets environnementaux du projet gazier Mackenzie

Pourquoi publier l'ébauche du cadre de référence?

L'ébauche du cadre de référence du mois d'octobre 2003 pour l'étude des effets environnementaux du projet gazier de la vallée du Mackenzie a été mise à la disposition du public à titre d'information seulement.

L'ébauche du cadre de référence aidera les gens à comprendre la nature et la portée des questions qui seront abordées au cours de l'examen environnemental du projet gazier Mackenzie.

Il est possible de s'en procurer une copie auprès du Secrétariat du projet de gaz du nord ou en consultant le registre public de l'Office national de l'énergie.

Quelle est l'importance de l'ébauche du cadre de référence?

Le cadre de référence fournit des lignes directrices pour la préparation d'une étude des effets environnementaux (EEE) du projet gazier Mackenzie. Il énonce la nature et la portée des questions qui doivent être abordées dans l'EEE.

L'étude des effets environnementaux sera préparée par les sociétés qui proposent la construction et l'exploitation du projet. Ce document sera de nature publique et sera soumis à une commission d'examen conjoint.

L'EIE inclura les prévisions des sociétés quant aux effets possibles du projet sur les plans environnemental, culturel, social et socio-économique. L'énoncé comprendra une description du projet et du milieu existant. L'EEE expliquera également comment les sociétés comptent éviter, minimiser ou atténuer les effets négatifs du projet.

Où en est-on avec l'ébauche du cadre de référence?

L'ébauche du cadre de référence est toujours un travail en cours.

Cette ébauche a été préparée par le personnel de l'Agence canadienne d'évaluation environnementale et du Secrétariat mixte des Comités des ressources renouvelables pour la région désignée des Inuvialuit, en vue du processus d'examen conjoint par une commission.

Le processus d'examen conjoint par une commission n'a pas encore commencé. On prévoit qu'il débutera au cours de l'été 2004.

Au mois de juin, une ébauche du document mis à jour sera publiée pour une période officielle de commentaires du public.

En quoi consiste le processus d'examen conjoint par une commission?

Comme l'énonce le Plan de coopération, la commission d'examen conjoint sera constituée de trois parties : l'Office d'examen des répercussions environnementales de la vallée du Mackenzie, les Inuvialuit et le ministre fédéral de l'Environnement.

Les étapes pour mettre en place la commission d'examen conjoint sont en cours. Le ministre fédéral de l'Environnement a renvoyé le projet à une commission d'examen conjoint en vertu de la *Loi canadienne sur l'évaluation environnementale*. Le Comité d'étude des répercussions environnementales des Inuvialuit a pris la décision de renvoyer le projet à une commission d'examen fédérale en vertu de la *Revendication de l'Arctique de l'Ouest : Convention définitive des Inuvialuit*. Une fois que l'Office d'examen des répercussions environnementales de la vallée du Mackenzie aura terminé son évaluation environnementale, il aura à prendre une décision concernant le renvoi à une commission d'examen conjoint. Lorsque toutes ces étapes seront achevées, l'ébauche finale du cadre de référence pourra être soumise aux commentaires du public.

Le gouvernement du Canada fournira de l'aide financière aux membres du public participant au processus d'examen conjoint par une commission, y compris pour la période de commentaires sur l'ébauche du cadre de référence. L'information sur l'aide financière sera communiquée avant que la période de consultation publique ait commencé.

Personnes ressources

Pour plus de renseignements, les médias peuvent communiquer avec :

Annette Bourgeois
Northern Gas Project Secretariat
Tel.: (867) 766-8602
Toll-free 1-866-372-8600
abourgeois@ngps.nt.ca

Elise Dhaussy
Canadian Environmental Assessment
Agency
Tel.: (613) 957-0406
elise.dhaussy@ceaa-acee.gc.ca

Ross Hicks
National Energy Board
Tel.: (403) 299-3930
rhicks@neb.gc.ca

Roland Semjanovs
Mackenzie Valley Environmental Impact
Review Board
Tel.: (867) 766-7051
coff@mveirb.nt.ca

DRAFT

ENVIRONMENTAL IMPACT STATEMENT TERMS OF REFERENCE

for the

MACKENZIE GAS PROJECT

Disclaimer

The Joint Secretariat for the Inuvialuit Renewable Resources Committees and the Canadian Environmental Assessment Agency have provided this version of the draft Environmental Impact Statement Terms of Reference for the Mackenzie Gas Project (draft EIS TOR) to the Environmental Impact Screening Committee for its consideration in applying subsections 11(13) to (16) of the Inuvialuit Final Agreement, in respect of the Mackenzie Gas Project.

The development of the draft EIS TOR is being carried out at a staff working level as a preparatory step to a Joint Review Panel, as contemplated by three public agreements:

- *Cooperation Plan for the Environmental Impact Assessment and Regulatory Review of a Northern Gas Pipeline Project through the Northwest Territories (Cooperation Plan) (June 2002):*
- *Agreement for an Environmental Impact Review of a Northern Gas Project (Agreement) (Draft, October 2002): and*
- *Memorandum of Understanding (MOU) for Inuvialuit Participation in the Environmental Review of any Transregional Gas Pipeline Project and any accompanying associated Gas Field Development in the Inuvialuit Settlement Region (signed October 2002).*

The Parties to the Agreement will finalize the EIS TOR at a future date and only after completion of other procedural steps described in the Cooperation Plan.

October 23, 2003

DRAFT

TABLE OF CONTENTS

- 1. INTRODUCTION..... 1
- 2. PURPOSE OF THE TERMS OF REFERENCE 2
- 3. PRINCIPLES..... 4
 - 3.1. CONTRIBUTION TO SUSTAINABILITY..... 4
 - 3.2. TRADITIONAL KNOWLEDGE..... 5
 - 3.3. LAND CLAIM AGREEMENTS..... 5
 - 3.4. PRECAUTIONARY APPROACH..... 6
- 4. GUIDANCE ON THE PREPARATION OF THE EIS..... 6
- 5. EXECUTIVE SUMMARY 7
- 6. INTRODUCTION..... 7
 - 6.1. THE PROPONENT..... 7
 - 6.2. PROJECT OVERVIEW AND PURPOSE 8
 - 6.3. THE PROJECT SETTING..... 8
 - 6.4. THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS AND APPROVALS 8
- 7. PROJECT DESCRIPTION 8
 - 7.1. GENERAL REQUIREMENTS 8
 - 7.2. COST, WORKFORCE, SCHEDULE, COMMUNITY RESOURCES AND BOUNDARIES 9
 - 7.3. PROPOSED FACILITIES 9
 - 7.4. LAND REQUIREMENTS AND RIGHT-OF-WAY (ROW) DIMENSIONS..... 10
 - 7.5. CONSTRUCTION PHASE..... 10
 - 7.6. OPERATION AND MAINTENANCE PHASE 12
 - 7.7. DECOMMISSIONING AND ABANDONMENT PHASE 12
 - 7.8. NEED FOR, PURPOSE OF, AND ALTERNATIVES TO THE PROJECT..... 13
 - 7.9. ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT 14
- 8. PUBLIC PARTICIPATION..... 14
- 9. EXISTING ENVIRONMENT 15
 - 9.1. INTRODUCTION 15
 - 9.2. ECOREGIONS AND ECOZONES 16
 - 9.3. PHYSICAL ENVIRONMENT 16
 - 9.3.1. *Terrain, Geology and Soils*..... 16
 - 9.3.2. *Permafrost*..... 17
 - 9.3.3. *Climate* 17
 - 9.3.4. *Air Quality*..... 18
 - 9.3.5. *Noise* 18
 - 9.3.6. *Water quality and quantity*..... 18
 - 9.4. BIOLOGICAL ENVIRONMENT..... 19
 - 9.4.1. *Fish and Aquatic Resources* 19
 - 9.4.2. *Vegetation* 20
 - 9.4.3. *Wildlife and Wildlife Habitat*..... 20
 - 9.4.4. *Birds and Bird Habitat* 21

DRAFT

- 9.5. HUMAN ENVIRONMENT..... 21
 - 9.5.1. Demographics 22
 - 9.5.2. National, Regional and Community Economies 22
 - 9.5.3. Education, Training and Skills..... 23
 - 9.5.4. Harvesting 23
 - 9.5.5. Land Use 24
 - 9.5.6. Human Health and Community Wellness 25
 - 9.5.7. Socio-cultural Patterns 25
 - 9.5.8. Infrastructure and Institutional Capacity..... 25
- 10. IMPACT ASSESSMENT METHODOLOGY..... 26**
 - 10.1. SELECTION OF VALUED ENVIRONMENTAL COMPONENTS 26
 - 10.2. IMPACT ANALYSIS METHODOLOGY 27
 - 10.3. ASSESSMENT BOUNDARIES 27
 - 10.4. MITIGATION MEASURES 28
 - 10.5. RESIDUAL IMPACTS..... 28
 - 10.6. SIGNIFICANCE 28
 - 10.7. LIKELIHOOD..... 29
 - 10.8. CONFIDENCE IN PREDICTION 29
 - 10.9. APPLICATION OF A PRECAUTIONARY APPROACH..... 29
- 11. PHYSICAL ENVIRONMENT IMPACT ANALYSIS 29**
 - 11.1. TERRAIN, GEOLOGY AND SOILS 29
 - 11.2. PERMAFROST 29
 - 11.3. AIR QUALITY 30
 - 11.4. NOISE 30
 - 11.5. WATER QUALITY AND QUANTITY 31
- 12. BIOLOGICAL ENVIRONMENT IMPACT ANALYSIS..... 31**
 - 12.1. SPECIES OF CONCERN..... 31
 - 12.2. FISH AND AQUATIC RESOURCES 32
 - 12.3. WILDLIFE AND WILDLIFE HABITAT 33
 - 12.4. BIRDS AND BIRD HABITAT 33
 - 12.5. VEGETATION 34
 - 12.6. BIODIVERSITY 34
- 13. HUMAN ENVIRONMENT IMPACT ANALYSIS..... 34**
 - 13.1. REGIONAL AND COMMUNITY DEMOGRAPHICS AND MOBILITY 35
 - 13.2. LOCAL, REGIONAL, PROVINCIAL AND TERRITORIAL ECONOMIES 35
 - 13.3. EDUCATION, TRAINING AND SKILLS 36
 - 13.4. SUBSISTENCE, SPORT AND COMMERCIAL HARVESTING 37
 - 13.5. HUMAN HEALTH AND COMMUNITY WELLNESS 37
 - 13.6. SOCIAL AND CULTURAL PATTERNS AND COHESION 38
 - 13.7. HERITAGE RESOURCES AND SPECIAL MANAGEMENT AREAS 38
 - 13.8. INFRASTRUCTURE AND INSTITUTIONAL CAPACITY 38
- 14. CHANGES TO THE PROJECT CAUSED BY THE ENVIRONMENT 39**
 - 14.1. CLIMATE CHANGE..... 39
- 15. CUMULATIVE IMPACTS 40**
- 16. CAPACITY OF RENEWABLE RESOURCES 42**

DRAFT

- 17. ACCIDENTS AND MALFUNCTIONS 43
- 18. OBLIGATIONS UNDER THE INUVIALUIT FINAL AGREEMENT 43
 - 18.1. WORST CASE SCENARIO 43
 - 18.2. WILDLIFE COMPENSATION..... 44
- 19. COMPENSATION 44
- 20. GREENHOUSE GAS EMISSIONS..... 44
- 21. EMERGENCY RESPONSE AND ENVIRONMENTAL MANAGEMENT 45
 - 21.1. FACILITY MONITORING 45
 - 21.2. EMERGENCY PREPAREDNESS 45
 - 21.3. ENVIRONMENTAL MANAGEMENT AND PROTECTION PROGRAMS..... 46
- 22. SOCIO-ECONOMIC POLICIES AND COMMITMENTS 46
- 23. COMPLIANCE INSPECTION, MONITORING AND FOLLOW-UP 47
- APPENDIX 1: DEFINITIONS..... 49
- APPENDIX II – LIST OF ABBREVIATIONS..... 51

DRAFT

1. INTRODUCTION

On 18 June 2003, the proponents for the proposed Mackenzie Gas Project (Project) filed a Preliminary Information Package describing the Project and related environmental and socio-economic issues. The Project includes natural gas development on the Mackenzie River Delta in the Northwest Territories, gathering lines, processing and transportation of gas south through the Mackenzie Valley to northern Alberta. The proponent consortium consists of Shell Canada Limited, ConocoPhillips Canada (North) Limited, ExxonMobil, Imperial Oil Resources Ventures Limited and the Aboriginal Pipeline Group (Proponent).

The Project is subject to three environmental impact assessment (EIA) jurisdictions: the *Canadian Environmental Assessment Act* (CEAA), the *Mackenzie Valley Resource Management Act* (MVRMA), and the *Western Arctic (Inuvialuit) Claims Settlement Act - Inuvialuit Final Agreement* (IFA). A single joint panel review that meets the needs of all three Acts is contemplated for the EIA of the Project. As described in an Agreement between the Minister of the Environment, the Inuvialuit and the Mackenzie Valley Environmental Impact Review Board¹, a Joint Review Panel (JRP or Panel) would conduct this EIA. Additionally, a Memorandum of Understanding between the Inuvialuit and the Minister of the Environment would give the Panel responsibility to address certain provisions of the IFA². These agreements include specific details about the EIA process important to the understanding of these terms of reference (TOR). In particular, the Agreement contains a list of factors that would be considered by the Panel during the conduct of the EIA.

The Project will also be subject to the regulatory requirements of other authorities with mandatory public hearing requirements, including the National Energy Board, the Mackenzie Valley Land and Water Board and the Northwest Territories Water Board. Other regulators for the Project include the Gwich'in Land and Water Board, the Sahtu Land and Water Board, the Inuvialuit Land Administration, Indian and Northern Affairs Canada, Fisheries and Oceans Canada, Environment Canada, Transport Canada, Natural Resources Canada and the Government of the Northwest Territories.

In recognition of the complex regulatory and EIA environment for a northern gas project, a Cooperation Plan for the Environmental Impact Assessment and Regulatory review of a Northern Gas Pipeline Development through the Northwest Territories (Cooperation Plan) was released in June 2002. The key purposes of the Cooperation Plan are to avoid duplication and ensure coordination among the parties. As discussed in the Cooperation Plan, the EIA process conducted by the Panel would be conducted, to the extent possible, in a manner consistent with these purposes.

¹ Agreement for an Environmental Impact Review of a Northern Gas Project, between the Mackenzie Valley Environmental Impact Review Board, the Inuvialuit and the Minister of the Environment, [date] (Agreement)

² Memorandum of Understanding between the Inuvialuit and the Minister of the Environment for Inuvialuit Participation in the Environmental Review of any Transregional Gas Pipeline Project and any accompanying Gas Field Development in the Inuvialuit Settlement Region, October 2002.

DRAFT

At the conclusion of the EIA process, the JRP would prepare a Panel report that outlines its finding and recommendations, and comments received from the public. The federal and territorial Ministers and the National Energy Board, pursuant to the MVRMA, and the responsible authorities with the approval of Governor-in-Council under CEEA, would determine if they accept the recommendations of the Panel. Once the decision on the Panel Report is made, the regulators with responsibilities under the MVRMA or CEEA would conform with the decision according to their respective jurisdictions. In this way, the JRP process would allow for careful consideration of the Project's potential impacts on the environment before decisions are made as to whether it can be allowed to proceed or with respect to any conditions under which it could proceed.

2. PURPOSE OF THE TERMS OF REFERENCE

The TOR contain guidelines for the preparation of an Environmental Impact Statement (EIS) for the Project. The TOR establish the nature and scope of the issues that the Proponent must address in the EIS. It is the responsibility of the Proponent to prepare the EIS in accordance with the TOR for submission to the Panel.

The EIS will serve as a basis for the Panel's review and evaluation of the potential impacts of the Project on the environment. The definition of 'impact on the environment' forms the basis for the EIS and includes consideration of physical, biological and human elements, or systems. The Joint Panel Agreement also identifies the factors to be considered by the Panel during the assessment.

The EIS will also help regulators and members of the public to understand the Project, the receiving environment and potential adverse or beneficial impacts, including how the Project could change the lives of the people in the Project area.

<p>Impact on the environment means, in respect of a project</p> <p>a) any change that the project may cause on the environment, and includes</p> <ul style="list-style-type: none">(i) any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;(ii) 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 <i>Species at Risk Act</i>;(iii) any change to present or future wildlife harvesting;(iv) any change to the social and cultural environment or to heritage resources; and <p>b) any change to the project that may be caused by the environment.</p>
--

DRAFT

FACTORS TO BE CONSIDERED DURING REVIEW

The Environmental Impact Review will have regard to the protection of the social, cultural and economic well-being of residents and communities and will include a consideration of the following factors:

1. The impact of the Project on the environment, including the impact of malfunctions or accidents that may occur in connection with the Project and any cumulative impact that is likely to result from the Project in combination with other projects or activities that have been or will be carried out;
2. The significance of any such impact;
3. Any comments from the public that are received during the Environmental Impact Review;
4. Measures that are technically and economically feasible and that would mitigate any significant adverse impact of the Project on the environment;
5. The purpose of the Project;
6. The need for the Project;
7. Alternatives to the Project;
8. Alternative means of carrying out the Project that are technically and economically feasible and the impact on the environment of any such alternative means;
9. The need for any follow-up program in respect of the Project, and the requirements of such a program;
10. The capacity of renewable resources that are likely to be significantly affected by the Project to meet existing and future needs;

In respect of the Inuvialuit Settlement Region recommend

- a) Terms and conditions relating to mitigation measures that would be necessary to minimize any negative impact on wildlife harvesting, as referred to in paragraph 13(11)(a) of the IFA, including, as far as is practicable, measures to restore wildlife and its habitat to its original state and to compensate Inuvialuit hunters, trappers and fishermen for the loss of their subsistence or commercial harvesting opportunities;
- b) An estimate of the potential liability of the Proponent, determined on a worst case scenario, taking into consideration the balance between economic factors, including the ability of the Proponent to pay, and environmental factors, as referred to in paragraph 13(11)(b) of the IFA.

DRAFT

3. PRINCIPLES

The purpose of this section is to identify principles that can provide context for the EIA process.

3.1. *Contribution to Sustainability*

Promotion of sustainable development is a fundamental purpose of EIA, which provides an effective means of integrating environmental, socio-economic and cultural factors into decision-making. The EIA process allows for the consideration a project's contribution towards achieving sustainability.

The CEAA defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The guiding goals and principles of the MVRMA and the IFA are to ensure that the EIA process has regard for the following:

- protecting the environment from significant adverse impacts of proposed developments
- 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

Reconciling economic development, social equity and environmental quality is at the core of sustainable development. Considering sustainable development in the EIA process includes recognizing:

- the potential impacts of the Project in relation to the social, economic, cultural and environmental goals and values of affected communities, the North and the rest of Canada
- the capacity of natural systems to maintain their structure and functions and to support biological diversity and productivity
- the capacity of the social and economic systems of the human environment to 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 durable and equitable social and economic benefits
- the rights of future generations to the sustainable use of renewable resources

A project's contribution to sustainability can be evaluated on the basis of the following:

- the extent to which a project may make a positive overall contribution towards the attainment of environmental, social and economic sustainability

DRAFT

- how the planning and design of a project have considered how it may affect achieving sustainable development
- how monitoring, management and reporting systems have incorporated indicators of sustainability

3.2. Traditional Knowledge

Many Aboriginal persons and communities have unique knowledge about the local environment, how it functions, and the ecological relationships that characterize it. This traditional knowledge is recognized as an important part of project planning and EIA processes.

In this case, traditional knowledge refers to a broad base of knowledge held by communities and individuals that is based on personal observation and collective experience. It may be acquired through experience, observation, from the land or from spiritual teachings. Passed from one generation to another through oral and/or written traditions, it is a dynamic, substantive, and distinct living knowledge.

Traditional knowledge, in combination with other information sources, is valuable in achieving a better understanding of potential impacts of projects. Traditional knowledge may, for example, contribute to the description of the existing physical, biological and human environments, natural cycles, resource distribution and abundance, long and short-term trends, and the use of lands and resources. It may also contribute to Project siting and design, identification of issues, the evaluation of potential impacts, and their significance, the effectiveness of proposed mitigation, cumulative impacts and the consideration of follow-up and monitoring programs.

3.3. Land Claim Agreements

Land claim agreements and treaties govern the relationship of aboriginal people to the land where much of the Project will be located. Within the Northwest Territories, there are three settled land claims which apply where the Project is located: *Western Arctic (Inuvialuit) Claims Settlement Act - Inuvialuit Final Agreement*, *the Sahtu Dene and Metis Comprehensive Land Claim Agreement*, and the *Gwich'in Comprehensive Land Claim Agreement*. Also in place in the geographic location that may be affected by the pipeline are the *Deh Cho Interim Measures Agreement*, the *Interim Resource Development Agreement* and Treaties 8 and 11.

Many of the goals, objectives and principles of the land claim agreements recognize the traditional way of life of Aboriginal people that is based on the cultural and economic relationship between the people and the land. All of these agreements incorporate measures for the protection and conservation of wildlife, the environment and biological productivity for present and future generations. They establish co-management institutions that affect the activities of all residents of the NWT. In addition, the agreements have specific provisions that enable beneficiaries to be meaningful participants in the northern and national economies, and to contribute to their ability to participate fully in all aspects of the economy while encouraging self-sufficiency.

DRAFT

The *Deh Cho Interim Measures Agreement* and the *Interim Resource Development Agreement* include temporary measures that reflect the desire on the part of the Deh Cho to protect the ecological integrity and manage resource development in the Deh Cho region.

Treaty 8 covers two-thirds (2/3) of Alberta and a large portion of the southern and southeastern Northwest Territories. The Treaty also protects hunting, fishing, trapping and other land based activities.

3.4. Precautionary Approach

For the purposes of this EIS, 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. For clarity, if the causal link between a Project activity and its impact on the environment is confirmed, there is no need to apply a precautionary approach, but rather for preventative or mitigative measures, as appropriate.

4. GUIDANCE ON THE PREPARATION OF THE EIS

The EIS must provide sufficient information to identify, describe and determine the significance of potential impacts on the environment that could arise from the Project, (please see section 9 Existing Environment and section 10 Methodology). The Proponent shall make best efforts, with the cooperation of other parties, to use and incorporate into the EIS traditional knowledge

The EIS will be placed on the public registry established for the Project and will be made available for public comment and review. The Panel will determine if the EIS is in conformity with the TOR and may give the Proponent additional instruction or clarification with respect to the expected content of the EIS and its expectation for meeting those requirements. Any changes to the description of the Project may entail a change to the TOR.

For clarity and ease of reference, the EIS shall include a guide that cross-references the TOR with the EIS, so that information may be easily located. This cross-reference should be in the form of a conformity table. Where any information required by the TOR is not provided with the EIS, the Proponent shall include the reason for the omission.

The EIS shall reference rather than repeat information that has already been presented in other sections of the document. A key subject index is recommended.

Supporting documentation shall be provided in separate volumes, and shall be referenced by volume, section and page in the text of the main EIS. This shall include the preparation of a commitments table that summarizes the proposed mitigation and other company commitments. This table shall be kept current throughout the review process.

The EIS should be written in the clearest language possible. Charts, diagrams and maps should be provided wherever useful to clarify the text, including perspective drawings that

DRAFT

convey what the developed sites would look like. Maps shall be of a limited number of common scales to allow for comparison and overlay of mapped features.

The EIS shall be submitted in English. The Panel may require the Proponent to translate some key sections of the EIS or other documents presented during the EIA process into French and Aboriginal languages.

The EIS shall be provided in both print and digital format. The digital format specifications will be provided by the Panel. The Executive Summary of the EIS shall also be prepared in both video and audio-tape formats. The Panel will specify the number of copies required.

5. EXECUTIVE SUMMARY

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

- background on the Proponent(s);
- Project overview;
- Project setting: geographic, physical, biological and human environments.; and
- key findings of the EIA .

As it may be used as a stand-alone document, the Executive Summary should present the information in a general manner focusing on the main issues and findings. The use of maps and figures to aid in the presentation of information is encouraged.

6. INTRODUCTION

The Introduction to should provide information related to the Proponent , Project Overview, Project Setting, Outline of EIA process and approvals, Study Strategy and Methodology, and Key Findings.

6.1. *The Proponent*

This section shall introduce readers to the Proponent, its consultants, and any contractors engaged for the Project.

Identify the ownership arrangements for various portions of the Project (e.g. field development, gathering system, process and compression facilities, transmission pipelines, etc.). Specifically, provide details on ownership of rights, operational arrangements, corporate and management structures, and relevant experience with similar large-scale operations in Canada and in other countries with similar regulatory and social policy regimes.

Identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS.

DRAFT

6.2. *Project Overview and Purpose*

This section of the EIS is not intended to be a detailed description of the Project, but rather a contextual summary of the Project and component parts. Direction with respect to the content of the full detailed description of the Project is provided in section 7, Project Description.

In this section, briefly summarize the Project, including its purpose, location, components and phases, workforce and equipment, associated activities, schedule, and cost.

6.3. *The Project Setting*

This section of the EIS is intended to introduce readers to the Project setting. Additional information requirements are identified in section 9, Existing Environment.

Provide a general overview of the geographic, ecological, social, economic and cultural setting in which the Project is proposed to take place.

6.4. *The Environmental Impact Assessment Process and Approvals*

Summarize the main steps in the EIA process leading to the establishment of the Panel and the main approvals required to undertake the Project.

As an Appendix, identify the federal, provincial, territorial and Aboriginal government (i.e., Inuvialuit Land Administration) permits and authorizations required for the Project. This information may be presented in table format and must include:

- activity requiring approval, and when it is required
- name of approval or permit and the authorization period
- regulatory board, agency or issuing body
- associated legislation

7. PROJECT DESCRIPTION

7.1. *General Requirements*

Provide a description of the Project components and related undertakings and physical activities. The description shall be provided by location and Project phase, including construction, operation, modification, decommissioning and abandonment.

Include both permanent and temporary facilities and activities for each phase. Use plans, diagrams, photos, maps, preliminary designs and/or design codes, as appropriate, to support the description.

DRAFT

7.2. Cost, Workforce, Schedule, Community Resources and Boundaries

For each Project phase, describe:

Cost

- the capital cost of the Project by phase and location
- any other costs that may be incurred

Schedule

- the scheduling and relative timing and duration of major activities
- the factors that influence scheduling or that could cause schedule changes

Boundaries

- the spatial and temporal boundaries for facilities, undertakings and activities, including the rationale for their delineation

Workforce

- the personnel requirements by occupation and/or skill
- the numbers of workers
- the duration of work

Community Resources

- any community resources that will be drawn upon including but not limited to accommodation, medical services, and sewage disposal

7.3. Proposed Facilities

Describe the main components of the Project, including:

Permanent structures and infrastructures:

- wells
- gathering lines (length, diameter, above ground/buried, etc.)
- processing and storage facilities
- compressor stations
- cathodic protection
- valves and meters
- pigging facilities
- communications systems
- access roads
- any other transportation infrastructure (airport, air strip, etc.)

Describe the properties and anticipated volumes of any product to be produced transported or disposed of during the operation of the proposed facilities.

DRAFT

7.4. Land Requirements and right-of-way (ROW) dimensions

Provide

- dimensions and location of the facility sites and ROW
- size and location of any temporary work room
- ownership of lands needed for permanent or temporary use
- zoning and/or other planning designations

7.5. Construction Phase

Identify and describe all physical works and related undertakings, as well as, physical activities carried out in respect of the Project during the construction phase including:

Activity

- type
- location
- timing
- frequency and duration

Transportation of Materials, Equipment and Workers

- access type (land, water, air) and location
- amount of material or equipment and the number of workers being transported at a given time
- timing
- frequency and duration
- locations
- type of transportation

Equipment Requirements

- types
- numbers
- duration of work

Temporary facilities and physical works:

- access roads, including winter roads
- equipment receiving, handling and storage areas, including barge landing sites
- machinery and fuel stockpile areas
- temporary work room
- shoo-flies
- disposal sites for domestic and construction waste
- drinking or waste water treatment and distribution facilities
- wastewater treatment facilities
- borrow pits or any other sources of granular materials

DRAFT

- fuel and hazardous materials handling and storage areas

Work Camps:

- location
- description of the facilities
- size and capacity
- duration and timing of use
- drinking water supply source
- method of managing wastewater and sewage, including any discharge areas;
- location and operating conditions of the solid waste disposal site
- power supply (generator capacities, location, etc.)
- management of any other installations (including fuel storage depots) required for the camps to function properly
- indication whether some of the camps will become permanent or be made available for various local parties interested in reusing them

Major Activities

- site preparation and site clearing including vegetation, soil, and rock removal, and associated disposal or storage methods
- moving of buildings and other structures or infrastructures
- forest clearing, recovery and elimination of wood wastes for all Project areas
- blasting activities, including explosives transportation, manufacture and storage in water and on land
- permafrost layer disruption
- excavation and grading

Watercourse Crossings

- crossing methods
- number and size of crossings
- equipment requirements
- timing and duration
- erosion control
- restoration

Testing of the Pipeline Prior to Use

- methods
- timing

Clean-up and Restoration

- activities
- timing
- final condition of work area
- criteria selected to measure clean-up success (quantitative and qualitative)

DRAFT

7.6. Operation and Maintenance Phase

Describe the operation of the major Project components and activities, including:

Operation of Facilities

- wells, pipelines, valves, compressor stations, processing and storage facilities
- access and transportation systems (air, land and water), with estimates of traffic types, frequency and duration
- worker accommodation
- communication systems
- solid and liquid waste storage, handling and treatment facilities
- Project systems with air and water effluents and emissions
- storage, handling and disposal of hazardous materials including explosives and petroleum products
- power generation and distribution

Maintenance and Repair

- anticipated repair and maintenance activities, and associated undertakings, that could result in interactions with the environment, including replacement of Project components, blowdowns or venting of natural gas
- general locations
- timing
- duration and frequency
- type of transportation

Inspection, Monitoring and Surveillance (see also section 21.1 Facility Monitoring)

- methods and related mode(s) of transportation
- general locations
- timing
- duration and frequency

Modification

- description of any anticipated modifications to the physical works or activities described above
- locations
- timing
- duration and frequency

7.7. Decommissioning and Abandonment Phase

Describe the proposed approach to, and conceptual plans for, decommissioning or abandoning Project facilities, including demolition, site clean-up and rehabilitation activities.

DRAFT

Specify ownership, transfer, and control of the different Project components and responsibility for maintaining the integrity of decommissioned or abandoned facilities.

Include, but not be limited to:

Temporary Facilities:

- work camps
- access infrastructure
- fuel storage areas
- borrow pits
- waste disposal
- equipment staging or storage areas
- temporary work room

Permanent Facilities

- wells
- pipelines (gathering and transmission)
- compression and processing facilities
- valve and meter station sites
- communications systems
- access
- worker accommodation

Monitoring (see also sections 21.1 Facility Monitoring and section 23 Monitoring)

- Project components
- monitoring requirements and criteria
- frequency, timing
- reporting
- responsibility
- type of transportation

7.8. Need for, purpose of, and alternatives to the Project

Describe, from the perspective of the Proponent, the need for and purpose of the Mackenzie Gas Project. The need for the Project is defined as the problem or opportunity that the Project is intending to solve or satisfy from the perspective of the Proponent and should clearly identify the fundamental rationale for the Project.

Describe alternatives to the Project, which are defined as functionally different ways to achieve the Project need and purpose.

For each alternative, the Proponent shall describe any criteria used to identify the major environmental, social, cultural, economic and technical costs and benefits of the alternatives considered.

DRAFT

7.9. Alternative Means of Carrying out the Project

Identify the technically and economically feasible ways that the Project can be carried out and summarize the Proponent's consideration of alternative means.

Detailed discussion of specific issues may be cross-referenced and provided in other sections of the EIS (e.g., selection of construction methods at watercourse crossings).

At a minimum, the discussion of alternative means should include:

Facility Siting and Routing:

- wells
- pipeline routes (gathering and transmission)
- processing facilities at the northern terminus
- compressor stations and valve sites
- access roads (temporary and permanent)
- temporary work room
- work camps
- equipment and materials landing and storage areas
- disposal sites

For each Project Phase:

- methods to carry out activities
- timing and scheduling
- selection of mitigation
- transportation of workforce and supplies

The analysis to determine feasibility of alternatives, including any criteria and assumptions used, should be provided.

For each feasible alternative means, the broad environmental, social and economic impacts should be described. The selection of any preferred alternatives must be based on clearly identified criteria, supporting information and analyses. Supporting studies to establish criteria (e.g., seismicity, permafrost) should be summarized and referenced.

In addition, a discussion should be provided about how communities were involved in the identification and selection of alternative means and the consistency of any criteria used, or means selected, with community knowledge or vision of the future.

8. PUBLIC PARTICIPATION

Public participation is an important component of the EIA process and a means by which the concerns and interests of the public are taken into account. In this section, outline the

DRAFT

engagement activities undertaken in respect of the EIS, identify and report on key issues raised, and describe how those issues were addressed.

More specifically:

- describe the methods used to identify, inform and solicit input to the EIS
- identify and document those who provided comments and input including residents and organizations in affected communities, other organizations, resource users and government agencies
- document outcomes of public engagement including any additional information provided to those consulted and any information provided by them
- document and track issues and describe any issues that may be outstanding
- document how public engagement was used in the identification of issues, impact prediction and mitigation, and how it affected the design of the Project

9. EXISTING ENVIRONMENT

9.1. Introduction

The description of the existing environment characterizes the setting and state of the physical, biological and human environments in which a Project is proposed to be situated. It provides the foundation for predicting Project-related impacts on the environment.

The description of the environment should, when read in combination with the Project description (section 7), allow the Panel to reasonably identify and understand the selection of Valued Environmental Components (VECs) (section 10.1), potential interactions, and potential impacts that may be caused by the Project.

Where possible, the description should identify and explain important interrelationships in the environment, its processes and systems (e.g., the contribution of the Mackenzie Delta to critical habitat, population stocks, the presence of particular species in select areas, the harvesting economy in important community harvest areas, or the levels and range of services provided by regional centres). The inclusion of maps, photos or other diagrams to illustrate key points is encouraged.

In describing the existing environment, consideration must be given to the current state, including trends and recent changes. The description of the baseline, while necessarily relying on recent and current data, must recognize that the dynamic nature of the environment. To assist in identifying and accounting for trends and changes in the environment that are unrelated to the Project:

1. describe any substantive changes to the environment of the Project area that have occurred since circa 1940 and indicate whether those changes are ongoing;
2. describe how the environment has changed in relation to recent hydrocarbon exploration and mining activities; and

DRAFT

3. predict the condition of the environment within the expected lifespan of the Project, if the Project did not proceed. Considerations shall include but not be limited to global climate change, variation in wildlife abundance and distribution, and demographic and socio-economic trends.

An important objective is to distinguish between the Project's effects on the environment, and the effects of other factors, particularly those referenced in (1) and (2) above and the analysis should reflect this intent, without requiring new research for this purpose.

9.2. *Ecoregions and Ecozones*

Provide a description, including characteristics, features and maps, of the ecoregions and ecozones in which the Project is located.

9.3. *Physical Environment*

9.3.1. *Terrain, Geology and Soils*

Describe the existing terrain, geology, and soils in the Project area, including a description, location, and geographic extent of the following features, including:

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

Bedrock, Surficial Materials and Soils

- bedrock type and depth
- unconsolidated materials
- landforms
- soil types, including group, series and type, as applicable

Granular Materials

- locations
- type of material
- size and depth of deposit
- quantity
- availability

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

- areas of ground instability such as landslides, mudflows, slumping and subsidence;
- areas of unstable or metastable soil
- fault zones

DRAFT

- active seismic areas (with risk ranking)
- avalanche zones
- areas susceptible to water, ice or wind erosion and scour

The sources of information and any classification systems relied upon must be referenced and, as necessary, described to assist in understanding the information provided.

9.3.2. Permafrost

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

- continuous, discontinuous and sporadic permafrost
- permafrost configuration including the frozen/unfrozen interfaces
- high-ice content soils and thaw-sensitive slopes and stream banks

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

9.3.3. 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 (snow, rain, fog)
- 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
- identify any guidelines followed when describing the baseline period (e.g. IPCC³ 1999 guidelines)
- identify the location of recording stations and length of record for any meteorological data presented

³ Intergovernmental Panel on Climate Change (IPCC)

DRAFT

- 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 (see section 14.1 Climate Change).

9.3.4. 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 quality (e.g. wind direction and velocity) and, if known, assimilative capacity
- the existing air quality in each airshed, based upon, but not limited to, parameters identified in relevant territorial or federal air quality standards or objectives,
- visibility
- the recording stations and length of record for any air quality data presented

9.3.5. Noise

Provide a description of the existing ambient acoustical environment for sites at which proposed facilities would generate noise (e.g., compression or processing facilities). 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
- identification of recording stations and length of record for any noise data presented

9.3.6. Water quality and quantity

Provide a description and maps of the existing water resources within or near the boundaries of the Project area including:

- waterbodies, watercourses and major drainage areas
- watercourses that have year round flow
- the extent of connectivity to adjacent watercourses

For each major drainage, drainages or major watercourse, as appropriate, provide a description of its hydrological characteristics, including:

DRAFT

- flow regimes
- seasonal flow patterns
- channel and bed stability
- freeze/thaw timing
- variability and sources

In the vicinity of communities and site-specific Project components (e.g., compressor stations, valves), 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 proposed facilities. For each area of water use that may be affected by the Project, identify:

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

Provide a description and maps of existing groundwater resources within the Project area, including:

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

9.4. Biological Environment

9.4.1. Fish and Aquatic Resources

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

- Fish species and any other aquatic resources of value present
- abundance and distribution, seasonal and life cycle movements, habitat requirements for their life stages, and sensitive periods
- for species of concern (see section 12.1), also describe specific location, population status, limits and size, sensitivity and 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 abundance and distribution
- known sensitive areas in terms of habitat type, species, and timing of use

DRAFT

- 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

9.4.2. 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 section 12.1), 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., medicinal herb gathering, berry picking, forestry)
- locations and quantities of merchantable timber

9.4.3. Wildlife and Wildlife Habitat

Provide a description of the existing wildlife resources⁴ with the Project area, including:

- Wildlife species present
- abundance and distribution, seasonal movements, habitat requirements (e.g. breeding, calving, feeding) and sensitive periods
- for species of concern (see section 11.1), also describe specific location(s), population status and trends, limits and size, critical habitat, sensitivity and 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 abundance and distribution
- species of particular 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 facilities and activities
- harvest pressures (subsistence, resident and non-resident harvesting and commercial harvesting⁵) by species, season and geographic area

⁴ Birds are addressed separately in section 8.4.4

⁵ For the purposes of the EIS, “subsistence” refers to domestic harvesting by Aboriginal people; “non-resident harvesting” includes commercially guided hunting; “resident harvesting” refers to harvest by those holding licenses; and “commercial harvesting” meaning all harvesting activities (excluding non-resident hunting) of a commercial nature.

DRAFT

9.4.4. 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 section 12.1), also describe specific location(s), population status and trends, limits and size, critical habitat, sensitivity and limiting factors status and trends, limits and size, critical habitat, sensitivity and limiting factors;
- species subject to exclusive or preferential rights granted by land claims;
- habitat types including local and regional abundance and distribution
- 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

9.5. Human Environment

The description of the human environment shall take a comprehensive approach that takes full account of the distinctive ways of life of the local communities, the critical requirements for their maintenance and enhancement, and the aspirations and plans of the communities. This approach shall have due regard for the distinctive economic and social role of subsistence and commercial harvesting at the household, community and regional levels, and other uses of lands and resources for traditional purposes by aboriginal and other local persons. It shall also consider the status, health, persistence, and resilience of those features of the local economy. Context-sensitive information shall be provided in sufficient detail to address common and diverse public interests and concerns, and the variable significance of the potential impacts affecting communities throughout the project area.

Describe the profile of the existing human environment, including conditions at the community, regional (e.g. Mackenzie Delta), territorial, provincial and national levels, in such a way that the potential impacts on the functioning and health of the human environment and the significance of these impacts can be assessed, including consideration of Project effects on the capacity of local, regional, territorial and federal governments to maintain services and service level. The profile should employ, as appropriate, social and economic indicators to help define the features of the system, and these shall be relevant to the selected valued components of the environment (see section 9.1) and to public concerns identified during public consultations.

Social and economic indicators should include, but not be limited to, demographics, employment, income, education and skills, use of land (including water and ice) and resources, including fish and wildlife harvesting, housing, quality of life, health, morbidity and mortality, diet

DRAFT

including country food, and substance abuse, and the interrelations of these indicators. Identify and justify any indicators and measures of personal and community health. Social and economic information provided should be broken down where possible by age, gender, and aboriginal status, and by community, land claims settlement region, and territorial, provincial and federal regions.

Identify, to the best of the Proponent's understanding, the various perspectives and aspirations for the future within the region. In this context, consider the relationship between the Project and any land claims agreements respecting the general area, as well as the relevant community and regional social and economic development strategies and plans.

Some information on social and economic matters must be obtained from a combination of the following sources: existing literature; existing administrative and monitoring data held chiefly by responsible governments and agencies; social surveys; and aboriginal knowledge. Ethical social research standards require that the last two can only be obtained with the consent and cooperation of local residents. Accordingly, demonstrate that the Proponent has made best efforts either to obtain this information itself, or where appropriate, to assist the appropriate aboriginal organizations and persons, to provide it for inclusion in the EIS, or to present it directly to the Panel during the course of the review.

In addition to the elements listed below, the description should also include any other issues identified through public consultations.

9.5.1. Demographics

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

- population and population trends by community and by region
- number of persons per household and number of households
- age and gender
- ethnicity
- births, deaths and migration

9.5.2. National, Regional and Community Economies

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

- national, provincial and territorial gross domestic product (GDP)
- employment rate (e.g., part-time, full-time, seasonal)
- employment by industry and occupation
- job vacancy and unfilled positions
- labour force growth

DRAFT

- 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
- level of local households consuming harvested meat and fish
- local consumer prices and cost of living, particularly with respect to shelter, food, utilities and transportation
- current status of the renewable resource sector and related harvest activities, and the factor that affect them
- local and regional economic development goals and objectives as identified in public consultations, land claims agreements and community, regional and territorial economic development plans and strategies
- current and projected land-based enterprises and economic activities, including tourism, outfitting, commercial harvesting and recreation
- number of licensed businesses
- number of licensed businesses by aboriginal ownership

9.5.3. 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
- training and/ or certification programs available within the region to residents of the Project area

9.5.4. Harvesting

Provide a description of current and historic harvesting, with special attention to subsistence and commercial harvesting, including:

- harvesting activities and other traditional uses by Aboriginal people within areas affected by the Project and their viability, with special consideration to:
 - the relation of subsistence, sport, and commercial harvesting to the household and community economy
 - current resource accessibility and quality for harvesters
 - level of harvests (see also sections 9.4.1 through 9.4.4)

DRAFT

- level of participation in harvesting activities
- location of harvest areas, with particular attention to areas where exclusive or preferential harvesting rights were granted by land claims, high use areas, areas of sensitivity, and seasonal access
- recent and current encroachments and restrictions of harvesting activities by competing and incompatible uses of land and resources or related regulations
- recreational and hunting and fishing and other harvesting activities by other residents and related high use and sensitive areas
- outfitting and trapping activities and related use areas

9.5.5. Land Use

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

- designated or planned (potential) land uses (e.g., parks and recreational areas, ecologically important areas; industrial zones)
- land use categories within the Project area, as identified in relevant community and regional, conservation and land use plans and strategies
- land use areas set out in the approved Gwich'in and draft Sahtu Regional Land Use Plans;
- valued aesthetic locations and their attributes
- archaeological, paleontological, burial, cultural, spiritual and heritage sites and resources
- seasonal and permanent camp areas (i.e, individual, work, recreational, commercial)

DRAFT

9.5.6. 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 and mental health of residents of the areas affected by the Project, based on local perceptions of health and well-being and quantitative indicators that include mortality, morbidity and social pathology or dysfunction (e.g., conjugal and family violence; suicide)
- nutrition (e.g. the availability and significance of country food sources as well as store-bought complementary food sources)
- diseases that include diabetes and infectious diseases
- alcohol, drug and other substance abuse
- support systems and programs available regionally and locally to address human health and community wellness

9.5.7. 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
- 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

9.5.8. 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
- fiscal relationships between federal, territorial and provincial governments including formula-funding and financial transfer arrangements and revenue-sharing formulas that may affect or be affected by the Project
- status of community and local government institutions and organizations, including their powers, responsibility, financing and fiscal capacity

DRAFT

- 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 additional and new needs. Particular attention shall be given to:
 - emergency response and law enforcement services
 - waste disposal and management
 - transportation systems (barging, roads, airports)
 - telephone/ communication service
 - fire protection
 - housing stock, costs and availability
 - health facilities and services, including medivac;
 - child care services
 - schools and education facilities
 - recreational facilities
 - churches
 - water and sewage facilities
 - power and fuel services
 - supply of aggregate and granular materials
 - planned major capital projects or planned major social or institutional changes in the project area

10. IMPACT ASSESSMENT METHODOLOGY

10.1. *Selection of Valued Environmental Components*

Valued Environmental Components (VEC) may be used to focus the EIA on those elements of the physical, biological and human environments that could be affected by the Project or could have an important effect on the Project, and are recognized as important for physical, ecological, cultural, social or economic reasons.

In general, the use of the VEC approach provides the foundation for predicting Project-related impacts on the environment. Through the identification of those VECs that may be impacted by the Project and describing the impacts of the Project on those VECs, it may be demonstrated whether or not there would be a likelihood of significant adverse impacts on the environment.

The selection of appropriate VECs is a critical component of scoping in EIA, to ensure that the assessment remains focused and the analysis remains practical and manageable.

The particular value of a VEC may relate not only to its role in the ecosystem, and social and economic systems, but also to the value placed on it by humans. The culture and way of life of the people using the area affected by the Project are themselves considered valued components. Accordingly, these linkages may result in overlap of VEC attributes, or overlap in considerations relevant to potential impacts on those VECs.

DRAFT

Describe:

- the methods by which VECs were identified; and
- the basis, or justification, for their selection.

10.2. Impact Analysis Methodology

Explain and justify the methods used to predict potential impacts of the Project on the VECs, on interactions among these components and on any broader relationships with the physical, biological and human environments.

In describing methodology:

- explain how scientific, engineering, traditional and other knowledge was used to reach conclusions
- identify and justify any assumptions made
- document all models and studies so that, to the extent possible, the analyses are transparent and reproducible
- identify which studies included the assistance of communities and who was involved
- specify data collection methods and report the uncertainty, reliability and sensitivity of the models used to reach conclusions
- support analyses, interpretation of results and conclusions with reference to appropriate literature and providing all relevant references
- specify and reference sources for any contributions based on traditional knowledge

Methods used to describe the environmental conditions and to identify and measure impacts on the environment should be in accordance with high standards in the relevant subject area. To the extent possible, use current, accepted methods in practice in the Northwest Territories and Alberta (e.g. air quality and noise modeling, field surveys for rare plant species).

10.3. Assessment Boundaries

Identify the spatial and temporal boundaries used in the EIA and their rationale.

Identify the study area and Project boundaries. Temporal boundaries should address the proposed duration and lifespan of Project activities and facilities, and duration of potential impacts. Where potential residual impacts could persist after decommissioning and abandonment, identify their anticipated duration.

It is recognized that boundaries may vary with Project component or activity and with each VEC. For each VEC selected, identify its ecological boundaries, social and economic boundaries, and administrative boundaries, as appropriate.

In identifying the spatial boundaries give particular attention to: (a) important habitat and range areas (e.g. proportion of population or critical habitat in a specified area); (b) the extent of land

DRAFT

use for subsistence, commercial, sport, cultural and recreational purposes; (c) traditional use areas; and (d) the zones of economic impact, including local, regional and territorial/provincial scales.

10.4. Mitigation Measures

Summarize proposed measures to mitigate adverse impacts of the Project or to enhance beneficial impacts. Indicate which mitigative measures are proven and which are experimental. Provide references or analysis that would support any statements regarding the effectiveness of proposed mitigation measures.

10.5. Residual Impacts

Residual impacts are those that remain following the application of mitigation. To assist in characterizing residual impacts, they shall be described based on:

- direction (i.e., adverse, beneficial, neutral)
- magnitude
- geographic extent
- timing and duration
- frequency
- reversibility

Additional descriptors may be used, if explained and supported.

10.6. Significance

Assess the significance of the residual Project-related impacts on the VECs selected for the physical, biological and human environments. This assessment must provide, for each VEC, an explicit, traceable link between potential impacts and significance.

Describe:

- how significance was determined (i.e., the process carried out or the methods used)
- the basis for the determination of significance (e.g., thresholds, stakeholder input, standards, guidelines, quantitative risk assessment)

Both the process and the basis for significance may vary among VECs. Therefore, describe specific methods, where appropriate. In part, the discussion of residual impacts and significance should indicate how the Project could contribute to sustainable social and economic development in the Project area.

DRAFT

10.7. Likelihood

For any residual adverse impacts that are predicted to be significant, describe the likelihood of occurrence. Likelihood should be based on clearly identified criteria that incorporate probability of occurrence and scientific uncertainty.

10.8. Confidence in Prediction

Indicate the degree of certainty in the impact predictions and determination of significance.

10.9. Application of a Precautionary Approach

Identify circumstances related to the Project for which 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.

11. PHYSICAL ENVIRONMENT IMPACT ANALYSIS

Assess the potential impacts of the Project on the VECs selected for the physical environment. For each VEC, the assessment must provide a clear, traceable path of information from the baseline conditions through the identification of potential impacts, mitigation, residual impacts and determination of significance.

11.1. Terrain, Geology and Soils

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

- slope and soil stability
- terrain profile (e.g. impacts related to subsidence)

11.2. Permafrost

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

- permafrost
- ice rich soils
- thermokarst development

DRAFT

11.3. 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
- the air quality parameters that would be affected by these emissions (e.g. dust, particulates (PM10 and PM2.5), sulphur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide, volatile organic compounds, formaldehyde, ground level ozone (O3), odour, etc.)
- how changes in air quality could impact wildlife and vegetation
- ice fog

Relevant territorial and federal air quality standards or guidelines should be discussed, as appropriate, including their purpose and use in relation to the Project phases.

Provide an assessment of the potential health impacts related to Project emissions. This assessment should include a quantitative assessment of health impacts from air emissions making use of dose-response relationship and multiple exposure pathways. Non-cancer and cancer health risks as well as chronic and acute impacts should be addressed, as relevant.

The identification of environmental and human health impacts of the Project related to air emissions should consider how the environment could affect air quality. For example, season, weather patterns and climate change could influence Project impacts.

Describe the regulatory or permitting regime related to Project emissions.

Identify and describe proposed participation in national or territorial air emission and reporting programs, such as the National Pollutant Release Inventory program.

11.4. Noise

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
- disturbance to wildlife and birds
- disturbance of harvest and recreational activities (including tourism)
- impacts on communities

DRAFT

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

Provide an assessment of the potential health impacts related to Project-related changes in noise levels.

11.5. 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
- hydrogeological resources
- changes to availability of water to users, or quality
- discharge of wastewater effluent, contaminants, chemical additives, etc.
- erosion
- subsidence
- slope stability
- flow or water levels
- water withdrawal and volume of withdrawal
- possibility of inter-basin transfer of water

12. BIOLOGICAL ENVIRONMENT IMPACT ANALYSIS

Assess the potential impacts of the Project on the VECs selected for the biological environment. For each VEC, the assessment must provide a clear, traceable path of information from the baseline conditions through the identification of potential impacts, mitigation, residual impacts and determination of significance.

In describing potential impacts to biological VECs, consider sensitivity to the Project, ability to recover from Project impacts, trends and natural variation. Describe any relevant policies, management plans or other measures to protect or manage biological VECs, including timing restrictions, protected areas or legislation.

12.1. Species of Concern

The federal *Species at Risk Act* (SARA) came into force in June 2003. Its purpose 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. Schedule 1 of SARA provides lists of wildlife species at risk that include mammals, birds, reptiles, amphibians, fish, lepidopterans, plants, lichens, mosses and molluscs.

DRAFT

The EIS 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 Appendix 1 Glossary). Accordingly, 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.

Additionally, provide the information necessary to evaluate the potential impacts of the Project on species of concern listed or tracked by the Northwest Territories or the Province of Alberta.

Discuss the potential impacts of the Project on species of concern in relation to applicable legislation, policy, management plans, recovery plans or land use planning initiatives.

12.2. Fish and Aquatic Resources

Describe and evaluate the potential impacts of the Project on fish and aquatic resources, including a consideration of:

- the proposed watercourse crossing 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 (instream, riparian and water quality)
 - identify any criteria that would be used to select the methods to be used for each watercourse crossing
- 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, overwintering)
- disruption of habitat (instream, riparian, water quality, flow)
- distribution or abundance
- blockages to movement
- blasting
- 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 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

DRAFT

- criteria for evaluating the success of mitigation or reclamation measures, and indicate when and how this evaluation would be conducted (see also section 23 Monitoring)

12.3. *Wildlife and Wildlife Habitat*

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

- direct and indirect alteration of habitat
- visual or auditory disturbance, including habitat avoidance in relation to Project facilities or activities
- disruption of sensitive life stages or habitat (e.g. calving, overwintering, migrating)
- wildlife movement patterns, distribution or abundance
- how Project-related changes in harvest pressures could impact the resource

Specifically, 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.

12.4. *Birds and Bird Habitat*

Describe and evaluate the potential impacts of the Project on 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)
- visual or auditory disturbance, including habitat avoidance in relation to Project facilities or activities
- bird distribution or abundance
- how Project-related changes in harvest pressures could impact the resource

DRAFT

12.5. Vegetation

Describe and evaluate the potential impacts of the Project on vegetation, including consideration of:

- alteration or loss of species, or vegetation assemblages that are rare, valued, protected or designated
- introduction of non-native species
- changes to the soil, hydrological or permafrost regimes
- re-establishment of vegetation
- how Project-related changes in harvest pressures could impact vegetation resources

12.6. Biodiversity

Describe how the Project could result in changes to biodiversity.

13. HUMAN ENVIRONMENT IMPACT ANALYSIS

Describe and evaluate the beneficial and adverse impacts of the Project on those VECs selected for the human environment, including social, cultural and economic systems. Additionally, describe and evaluate changes to health and to socio-economic conditions that may occur as a result of Project-related impacts to the biological and physical environments. For each VEC, the assessment must provide a clear, traceable path of information from the baseline conditions through the identification of potential impacts, mitigation, residual impacts and determination of significance.

In the analysis, identify and take into account the particular needs and interests of various segments of the local populations (e.g. youth, elders, women, harvesters), and consider how the Project may affect each of them. The Proponent shall, to the best of its ability and within available knowledge, indicate how the Project will enhance and/or impair both the current social, cultural, and economic ways of life in the communities, and community aspirations for the future, including other economic opportunities. Changes to the human, physical and biological environment induced by the Project, how people, communities, institutions and governments will adapt to these changes and what the consequences of that adaptation are important considerations in the impact analysis.

In considering the local impacts, the Proponent shall have due regard for the attitudes and perceptions of local residents, and how these are grounded in their culture, social organization, and historical experience. Include a consideration of people's possible reactions to project-

DRAFT

related effects and the capacity of the people, communities and institutions to respond to the Project. Discuss the range of changes that may be induced.

Subject to confidentiality, where mitigation relies or is dependent in part or in whole on actions to be taken by parties other than the Proponent (e.g., where local access to certain jobs requires that a training program be offered by an outside agency), provide information about these required actions and about any agreements reached, and a prediction of the effectiveness of these mitigation measures.

In assessing the effects of the Project on people's lives, give particular attention to the comparative adverse and beneficial effects for workers, their spouses and families, and other residents, of a major employment base away from the communities, rotational work schedules and the presence of large numbers of transient employees and contractors in the region. Describe plans to mitigate the identified adverse effects.

In assessing the effects of the Project on harvesting activities, give particular attention to the comparative adverse and beneficial effects on social, economic and cultural systems and determinants of human health, particularly at the household and community levels.

With respect to mitigation measures to reduce or offset adverse effects on the lives 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, and gender where appropriate and describe how aboriginal and community organizations will be involved in the development, application and ongoing evaluation of these measures.

13.1. Regional and Community Demographics and Mobility

Describe and evaluate the potential impacts of the Project on intra-regional and inter-regional migration and residence patterns

13.2. Local, Regional, Provincial and Territorial Economies

Describe and evaluate the potential impacts of the Project (by Project phase and by year) on local, regional, provincial and territorial economies, including consideration of:

- employment and income, 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 over the life of the Project. Include estimates of the following:
 - territorial, regional, local, aboriginal and female participation
 - 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)

DRAFT

- 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
- the role of unions in hiring and employment
- Competition for labour between the Project and existing businesses, 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 and costs of living, particularly with regard to food, shelter, utilities and transportation
- how Project-related impacts on harvested resources or harvest activities affect community income and household economics, and sustainability of traditional economies (see also sections 12, 13.4, 13.5 and 13.6)
- activities such as tourism, outfitting, trapping, commercial harvesting and recreation, including foregone or precluded opportunities that are lost or deferred as a result of the Project
- spin-off economic activity
- opportunities for local, regional, provincial and territorial businesses to supply goods and services both directly to the Project and to meet the demand created by the expenditure of new income by employees of, and suppliers to, the Project
- distribution of costs and benefits of Project activities at local, regional, provincial/territorial and national levels
- competition between land users as a result of modifications to or displacement from the land resulting from the Project
- opportunities to diversify the local, regional and territorial economic base to produce and to supply new goods and services
- 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

13.3. 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
- educational achievement and attainment, including school drop-out
- Project-relevant local and regional training opportunities available to local people
- Project-related skill levels in the workforce that could be applied to other available projects or sectors

DRAFT

13.4. Subsistence, Sport and Commercial Harvesting

Describe and evaluate the potential impacts of the Project on harvesting (see also sections 12, 13.2, 13.5 and 13.6), including a consideration of:

- changes in travel patterns resulting from construction of seasonal and all-weather roads; temporary and permanent air strips, and by barging, road and air transport activities
- disturbance of harvest patterns; or loss or alteration of high-value harvest areas;
- changes in harvest level
- changes in the abundance and distribution of harvested resources, including wildlife, bird, fish and vegetation, that would adversely affect harvesting (see also sections 12.2 through 12.5)
- changes to harvesting costs created by the Project
- changes to harvest effort as perceived by harvesters
- competition between harvesters within and between communities as a result of loss or alteration to the land or displacement from the land resulting from the Project
- changes in the quality of harvested species, including contamination, that would adversely 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
- control of hunting, fishing, or harassment of animals by on-site personnel

13.5. Human Health and Community Wellness

Describe and evaluate the potential impacts of the Project on human health and community wellness⁶, including a consideration of:

- local perceptions of physical and mental health and changes in the quality of life
- measures of mortality and morbidity, and of social pathology and dysfunction such as unwanted pregnancies, sexually transmitted diseases, substance abuse, physical and sexual violence, and other crime
- the presence or absence of support systems and programs regionally and locally and their capacity to address human health and community wellness
- changes in the diet and use of country food
- how Project-related impacts on harvested resources or harvest activities affect health and wellness (see also sections 12, 13.2, 13.4 and 13.6)

⁶ Additional health-related discussions are located in sections 11.1 (Air Quality) and 11.2 (Noise).

DRAFT

13.6. Social and Cultural Patterns and Cohesion

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

- 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
- social relations between residents and non-residents, between men and women, among generations, and between aboriginal and non-aboriginal persons
- how Project-related impacts on harvested resources or harvest activities affect social and cultural patterns and cohesion (see also sections 12, 13.2, 13.4 and 13.5)

13.7. Heritage Resources and Special Management Areas

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

- historic, archaeological, palaeontological, cultural and heritage resources/ sites/ trails;
- established or identified candidate areas, or other proposed special management areas such as protected areas, parks, sanctuaries or preserves;
- conservation plans, protected area plans and special management area plans; and
- valued visual and aesthetic locations and their attributes

13.8. Infrastructure and Institutional Capacity

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

- changes in the availability, quality and affordability of shelter in communities over the lifespan of the Project
- any 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 impacts on:
 - quarries and quarry materials available to local and territorial governments
 - navigability, public navigation or safety of navigators, including location, timing and duration, by project phase
 - transportation (roads, airports, barges)

Describe measures to reduce the financial burden caused by the Project on infrastructure and institutional capacity.

DRAFT

14. CHANGES TO THE PROJECT CAUSED BY THE ENVIRONMENT

Describe and evaluate changes to the Project that may be caused by the environment, including a specific consideration of climate change (section 14.1).

Identify those elements of the environment that may cause a change to the Project during its lifespan and how they could change the Project. Discuss how those elements were considered in the Project design, siting, selection of mitigation, scheduling, and surveillance and monitoring.

Specially, include a consideration of the following:

- extreme weather events
- flooding
- subsidence
- ice scour
- seismicity
- unstable slopes
- permafrost.

14.1. *Climate Change*

Climate change is defined by the United Nations Framework Convention on Climate Change as, “a change of climate which is attributed directly or indirectly to human activity that alters the composition of global atmosphere and which is in addition to natural climate variability observed over comparable time periods”. Climate change, as opposed to climate variability, is considered to be changes over relatively long periods of time (e.g., 30 years) that do not represent variability around average values for year-to-year or decade-to-decade.

Describe how any changes to the climate in the Project area could affect the Project over its lifespan.

Future conditions:

To assist in the evaluation of how climate change could affect the Project over its lifespan, provide a scenario of possible future climate conditions. For certain portions of the Project area, it may be necessary to identify potential changes in sea level that could occur because of climate change.

More than one scenario may be required to cover the Project lifespan, to address regional differences or uncertainties, or to clarify potential responses of specific climate variables. For any scenario provided, the methodology, resolution, validity, unknowns, assumptions, and level of uncertainty with respect to its development must be provided.

In particular, the description of future conditions should:

DRAFT

- estimate and discuss the extent to which the key weather and climate parameters are projected to be affected by climate change over the Project lifespan. Discuss trends or changes in climate anticipated to occur over the lifespan of the Project; and associated hazards or limitations presented to the Project
- identify the climate parameters that may change and to which the Project, or Project components, would be sensitive

Changes to the Project caused by Climate Change:

Identify the sensitivity of the Project, or Project components, to specific climate parameters.

Describe how changes in these parameters may change the Project over its lifespan. Provide this description in general, by project phase (design, construction, operation etc), by facility type, location, time of year, etc, as appropriate.

Identify any Project-related risk(s) to the public that may be sensitive to changes in climate parameters and describe how any risk(s) may change through the Project lifespan.

Mitigation and Monitoring:

Describe any specific ways in which the Project would be designed, constructed, or operated to reduce the Project's vulnerability to changes in specific climate parameters. Discuss the economic and technical feasibility of each option and, for each feasible option, describe the broad impacts on the environment impacts, including any social, cultural or economic considerations .

Describe ways in which the Project could be designed, constructed, or operated to address any potential risk to the public from the Project that could result from changes in climate parameters.

Identify any planned monitoring of climate parameters or of the Project with respect to climate change (see also sections 22.1 Facility Monitoring and section 23 Monitoring).

15. CUMULATIVE IMPACTS

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 IFA processes, MVRMA and CEAA each require the consideration of potential cumulative impacts as part of the impact assessment of projects.

The planning and conduct of an evaluation of cumulative impacts that may occur as a result of the Project should be guided by the following questions:

- Which are the most appropriate VECs on which to focus the cumulative effects assessment?
- For the selected VECs, will the residual impacts caused by the Project act in a cumulative manner with those of other Projects, activities or land use pressures? Which ones?

DRAFT

- Will the impacts of the Project, in combination with these other impacts, measurably change the state, health or sustainability of the VEC? If so, how?
- How can the Project's contribution to cumulative impacts be avoided or mitigated?
- What is the significance of the potential cumulative impacts?
- How can and should potential cumulative impacts be managed and monitored? What are the opportunities to manage cumulative impacts?

The cumulative impacts assessment must include the following five components:

- 1) Scoping
- 2) Analysis
- 3) Mitigation
- 4) Significance
- 5) Follow-up

Scoping: Identify the VECs, or their indicators, on which the cumulative impacts assessment is focused, including the rationale for their selection. The spatial and temporal boundaries for the cumulative impact assessment must be presented for each VEC selected. The sources of potential cumulative impacts must be identified. Accordingly, identify other Projects and activities that could produce impacts a) on the selected VEC; and b) within the boundaries defined; and c) whose impacts would act in combination with the residual impacts of the Project.

The assessment of cumulative impacts should be limited to cumulative impacts on the environment that are likely and for which measurable or detectable residual impacts are predicted.

In the case of future actions, a degree of certainty that the project or activity will proceed is necessary for it to be included. For clarity, the identification of future Projects and activities should include those that may be reasonably foreseen to be carried out. These are typically defined as Projects that are in some form of recognized approval process. Projects that are conceptual in nature or otherwise limited with respect to information on specifications, timing or location may not be sufficiently developed to contribute to the assessment of cumulative impacts in a meaningful manner. Hypothetical Projects must not be included. A rationale for the inclusion or Projects and activities, or the exclusion of certain others, should be provided.

Analysis: The analysis of the effect must enable an understanding of the incremental contribution of all projects and activities, and of the Project alone, to the total cumulative effect on the VEC. Different types of potential impacts should be discussed, such as synergistic, additive, and spatial or temporal overlap. Impact pathways and trends should be included.

Many factors that impact, or could impact, a VEC are not solely the result of a particular project. While a project-specific assessment of cumulative impacts is not responsible for assessing all external impacts, the assessment of impact must consider how a project-specific effect, or suite of Project-specific impacts, would interact with these external factors. Ensure that the assessment makes clear the contribution of the Project to a total potential cumulative effect.

DRAFT

The potential cumulative impacts of the Project must be placed in a relevant and appropriate regional context, or contexts. Regional plans, community conservation plans, recovery plans, management plans, thresholds, objectives and/or guidelines etc may be helpful in conveying an integrated sense of the aspirations of people and communities in the Project area with respect to the sustainability of the land, wildlife, culture, social structure and economy.

Mitigation: Identify tools and approaches to mitigating cumulative impacts, including economic and technical considerations, as well as community involvement. Identify proposed mitigation, including a discussion on goals and effectiveness.

If Project-related cumulative impacts remain following mitigation, discuss the need to pursue regional and/or non-Project specific mitigative measures. In this case, discuss how the Proponent would contribute to, influence or control the implementation of mitigation that extends beyond its Project (e.g., possible approaches, policies, coordination, partnerships).

Significance: For each VEC or indicator assessed, evaluate the significance of residual cumulative impacts and discuss the relative contribution of the Project to those impacts. Identify how significance was determined.

The analysis must indicate whether the Project would be responsible for adversely affecting a VEC or indicator beyond an acceptable point. Any link made between significance and the regional context (see above) should be clear.

Should significant adverse cumulative impacts be identified, discuss likelihood of occurrence, based on probability of occurrence and scientific certainty.

Follow-up: Follow-up refers to proposed monitoring that would be undertaken following Project approval, specifically to verify the accuracy of cumulative impacts predictions and the effectiveness of mitigation (see also section 23 Compliance Inspection, Monitoring and Follow-up).

Discuss the need for a follow-up program, how need was established, and the relationship of the program to other regional initiatives and programs. For proposed programs, identify study purpose, design, duration and timing.

Identify the role of communities, and others, in the identification of study need, in program design and in program implementation. Where potential cumulative impacts could overlap jurisdictions, describe the reporting structure and responsibilities, including the need for ongoing consultation.

16. CAPACITY OF RENEWABLE RESOURCES

Describe and evaluate the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future. Identify those resources likely to be significantly impacted by the Project, and any criteria used in determining whether their sustainable use would be affected.

DRAFT

17. ACCIDENTS AND MALFUNCTIONS

Describe and evaluate the potential impacts of Project-related accidents and malfunctions on the environment.

Identify and discuss, for each project phase, the potential accidents or malfunctions that occur as a result of the Project, including a consideration of:

- spills of a hazardous material (on land, ice and in water)
- fire
- use of explosives
- transportation accidents (air, land, water)
- rupture or failure of a pipeline (on land, beneath a watercourse)
- failure of components at a compression or processing facility
- harvesting
- social and cultural elements, or systems

Particular attention should be focused on sensitive components of the environment that could be affected in the event of an accident or malfunction and that could make the consequences major or worse (e.g. proximity of communities, natural sites of particular value). Where potentially significant impacts could occur as a result of an accident or malfunction, assess the probability of such an occurrence, taking into account weather or external events that present contributing factors. Identify the contingency and/or response measures that would be in place should an accident occur (also see section 21 Emergency Response and Environmental Management).

18. OBLIGATIONS UNDER THE INUVIALUIT FINAL AGREEMENT

18.1. Worst Case Scenario

The worst-case scenario will be the basis for the Panel to estimate the potential liability of the Proponent with respect to harvest compensation and habitat remediation, as per paragraph 13(11)(b) of the IFA.

Jointly develop, with the Inuvialuit, a worst-case scenario for the Project (paragraph 13(11)(b) of the IFA). Document the process used to develop the scenario, including the dates that consultation took place with the Inuvialuit.

Provide the worst-case scenario. Describe and evaluate the potential impacts of the worst-case scenario on the environment.

DRAFT

18.2. *Wildlife Compensation*

Describe mitigative or remedial measures necessary to minimize any negative impact on wildlife harvesting, as referred to in paragraph 13(11)(a) and (b) of the IFA.

Describe plans to prevent damage to wildlife and its habitat and to avoid disruption of harvesting activities as a result of the Project, and, if damage occurs, to restore wildlife and its habitat as far as is practicable to its original state and to compensate hunters, trappers and fishermen for:

- loss or damage to property or equipment used in wildlife harvesting or to wildlife harvested
- present and future loss of income from wildlife harvesting
- present and future loss of wildlife harvested for personal use or which is provided by participants to other participants for their personal use

19. **COMPENSATION**

Describe any plans for compensation that would be part of proposed mitigation as informed by land claim agreements, governmental policies, corporate agreements, etc.

20. **GREENHOUSE GAS EMISSIONS**

Increases in greenhouse gases (GHG) in the atmosphere have been linked to human activity. In this case, Project emissions of GHG may warrant the application of a precautionary approach (see section 3.5 Precautionary Approach).

To provide clarity, carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) are collectively referred to here as GHG for the purposes of the following information requirements.

Identify the sources, quantities, and frequency of Project-related emissions of GHG, including:

- anticipated during operation of project components and during project activities such as maintenance and repair
- that could result from accidents or malfunctions
- that could result from fugitive emissions

Identify the various ways that reductions in GHG emissions could be realized, including a discussion on the technical and economic feasibility of options. As appropriate, provide an estimate of emissions volume and frequency for each option considered.

Identify any required permits with respect to the emission of greenhouse gasses from the operation of the Project facilities, including maintenance and repair. Indicate whether permits would be issued for each source of emissions or combination of sources.

DRAFT

Describe any relevant federal, territorial or provincial actions and/or initiatives, including policies or accords, that currently exist to identify, track, report or manage GHG.

Describe the means by which GHG emissions would be managed. Describe any proposed verification, monitoring and/or reporting of GHG emissions that would be carried out during operation, including the identification of facilities, frequency and methods.

21. EMERGENCY RESPONSE AND ENVIRONMENTAL MANAGEMENT

Describe company programs regarding facility monitoring, emergency preparedness and environmental management. The descriptions should be in sufficient detail in order to understand the scope of the programs, how they work, how they are developed, the link to any regulatory requirements and the expected components of these programs.

21.1. Facility Monitoring

The programs to monitor the physical condition of Project facilities and their operation are relevant to understanding how Proponent design and management reduces the risk of an accident or malfunction occurring and is able to detect one, if it occurs.

Describe the safety and detection measures that would be incorporated at Project facilities, including such things as: access restrictions, monitoring and surveillance systems, pipeline integrity programs, malfunction detection devices, emergency shutdown systems, fire fighting systems, emergency power units and communications systems.

21.2. Emergency Preparedness

Provide a general description of the Proponent's Emergency Response Procedures, including the company level of preparedness, safety, response capability and procedures in the case of an emergency. Include the types of Emergency Response Procedures that would be developed, the purpose of the programs and what the programs are intended to achieve. Identify the facilities and activities for which procedures would be developed.

The descriptions should provide adequate detail to understand how the Emergency Response Programs would work, including the identification of emergency conditions, response procedures and the steps that would be taken to notify or inform all persons who may be affected. Describe the process by which the programs would be developed, timing, and the communities, agencies, boards and regulators that would be consulted during their preparation.

Identify any applicable regulatory requirements to have emergency procedures in place, including relevant standards and the expected components of these programs. Discuss consistency with municipal requirements, where present.

DRAFT

21.3. Environmental Management and Protection Programs

Describe any plans, programs and policies relevant to the design and implementation of standard mitigation practices that would be followed during the lifespan of the Project.

The description should allow understanding of the purpose of the programs, the scope of the programs, how the programs would function, who would be responsible for their implementation and how reporting would take place. Describe how the results of the programs would be used to refine or modify the design and implementation of management plans, mitigation measures and Project operations. Include: the process by which the programs would be developed; timing of development and updating; and the method(s) by which adequacy and effectiveness of the programs would be evaluated and tracked.

Identify any regulatory requirements relevant to monitoring as well as corporate management plans, programs, policies and quality assurance/quality control measures.

Identify the communities, agencies, boards and regulators that would be involved during the preparation of the programs and any opportunities for partnerships, coordination and participation.

22. SOCIO-ECONOMIC POLICIES AND COMMITMENTS

Describe any commitments, policies, and arrangements directed at promoting beneficial, or mitigating adverse impacts to social 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:

- occupational health and safety and related training, committees and communications, and emergency response plans for workplace accidents
- commuting and work rotation of workers and contractors
- recruitment, training, hiring, employment counselling, pay equity and employment, including those policies specifically for Aboriginal and local candidates, and those promoting Aboriginal participation
- orientation to the workplace, cross-cultural, anti-racism and anti-sexism policies and programs, and personal counselling, for both Aboriginal and non-Aboriginal employees
- control of movements to and from the pipeline lease area by employees, contractors and others
- reducing the potential for social problems on the job-site or in the home communities resulting from the Project, including policies on sexual and gender harassment, alcohol and drugs on the job site and work and pay schedules
- ensuring public safety on site with respect to firearms, while respecting the rights and needs of harvesters from adjacent communities
- managing hunting, fishing and gathering on, or from, the site by non-Aboriginal employees, while respecting the harvest rights of Aboriginal employees

DRAFT

- accommodating Aboriginal personnel wishing to pursue harvesting and traditional activities, for example with respect to work scheduling
- use of committees and liaison arrangements to respond to issues raised by employees;
- promoting activities and programs that increase community stability
- contracting and procurement, including those which promote local sourcing, and participation of local businesses and how this will be accomplished
- any policies encouraging advancement in education or encouraging youth to seek higher education

23. COMPLIANCE INSPECTION, MONITORING AND FOLLOW-UP

Identify and describe proposed environmental and socio-economic monitoring programs in terms of:

Compliance Inspection: the activities, procedures and programs undertaken to confirm the implementation of approved design standards, mitigation, conditions of approval and company commitments, including proposed mitigation.

Monitoring: monitoring to track conditions or issues during the Project lifespan or at certain times; and

Follow-up: a program to verify the accuracy of impact predictions and determine the effectiveness of mitigative measures.

Detail should be adequate to allow an understanding of the purpose of the programs, how issues, subjects or indicators would be selected, how the programs would function, who would be responsible for their implementation and how reporting would take place. Identify any regulatory requirements relevant to monitoring as well as corporate management plans, programs, policies and quality assurance/quality control measures.

Specifically, describe how the programs would verify any predictions of significant adverse impact and the effectiveness of related mitigation. Discuss how the programs could identify or measure how the Project advances the objectives of sustainability and maximizes beneficial impacts in the Project area, in relation to impact predictions

Describe how the results of the programs would be used to refine or modify the design and implementation of management plans, mitigation measures and Project operations. Include the process by which the programs would be developed, the timing of program development and updating and the method(s) by which adequacy and effectiveness of the programs would be evaluated and tracked.

Additionally, identify the communities, agencies, boards and regulators that would be involved during the preparation of the programs and any opportunities for partnerships, coordination and participation. Discuss the ways in which holders of traditional knowledge and area residents would be involved in the design and implementation of the programs.

DRAFT

Specifically discuss the need for, and requirements of, a follow-up program, including consideration of:

- the need for such a program and its objectives
- how it would be structured
- which elements of the monitoring program it would incorporate
- the roles to be played by the Proponent, regulatory agencies, Aboriginal people and others in such a program
- possible involvement of independent researchers
- the sources of funding for the program
- reporting

DRAFT

APPENDIX 1: Definitions

Abandonment: the permanent removal from service of project facilities with, in the case of pipeline facilities, the discontinuation of service to end users.

Cumulative Impacts: changes to the environment that are caused by an action in combination with other past, present and future human actions. A cumulative impact assessment is an assessment of those impacts. Actions include both facilities and activities.

Environment means the components of the Earth and includes:

- (a) land, water and 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 (a) and (b).

Environmental Impact Assessment (EIA) means the process of evaluating the physical, biological, cultural, social and economic impacts of a proposed project.

Environmental Impact Statement (EIS) means a report prepared by the Proponent according to the direction in the terms of reference.

Follow-up means a program to verify the accuracy of impact predictions and determine the effectiveness of mitigative measures.

Harvesting means gathering, hunting, trapping or fishing or the reduction of wildlife into possession by any lawful means.

Impact on the environment means, in respect of a project

- a) any change that the project may cause on the environment, and includes
 - (i) any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
 - (ii) 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*;
 - (iii) any change to present or future wildlife harvesting;
 - (iv) any change to the social and cultural environment or to heritage resources; and
- b) any change to the project that may be caused by the environment.

Mitigation means action for the control, reduction, or elimination of an adverse impact of the Project on the environment and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation, remedial measures or other

DRAFT

Valued Environmental Components means valued components of the physical, biological and human environments selected on which to focus the assessment of impacts of a project.

DRAFT

APPENDIX II – List of Abbreviations

CEAA	Canadian Environmental Assessment Act
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
GDP	Gross Domestic Product
JRP	Joint Review Panel
IFA	the Western Arctic (Inuvialuit) Claims Settlement Act - Inuvialuit Final Agreement
IPCC	Intergovernmental Panel on Climate Change
MVRMA	Mackenzie Valley Resource Management Act
NEB	National Energy Board
TOR	Terms of Reference
VEC	Valued Environmental Component
Project	the proposed Mackenzie Gas Project
Proponent	a consortium consisting of Shell Canada Limited, ConocoPhillips Canada (North) Limited, ExxonMobil, Imperial Oil Resources Ventures Limited and the Aboriginal Pipeline Group