
TITLE	GSA Application for a Type A Water Licence
SECTION	1: Introduction
SUBJECT	1: Purpose

TYPE OF APPLICATION

This is an application for a Type A water licence (the application) under Section 14 of the *Northwest Territories Waters Act*. The undertakings in this application pertain to the water use and deposits associated with construction and operation of the Mackenzie Gas Project (the project) in the Gwich'in Settlement Area (GSA).

This application is being submitted to the Mackenzie Valley Land and Water Board (the Board) pursuant to Section 103 (1) of the *Mackenzie Valley Resource Management Act* (MVRMA). It covers an initial five-year term from 2006 through 2011, and is part of a suite of applications that are being submitted to various regulatory agencies in support of the project. These include:

- applications to the National Energy Board (NEB) to permit the construction and operation of three onshore gas fields (anchor fields), a gathering system and a natural gas pipeline
- other land use and water licence applications to the Board for development activities in the Mackenzie Valley
- various supporting applications to federal and territorial government departments and agencies
- applications to the Gwich'in Land Use Planning Board (GLUPB) for an amendment and an exception to the approved land use plan for the GSA
- applications to the Inuvialuit Land Administration (ILA), the Department of Indian and Northern Affairs Canada (INAC), and the Northwest Territories Water Board (NWTWB) for land and water use activities in the Inuvialuit Settlement Region (ISR)

In addition to the applications, an environmental impact statement (EIS) has been filed with the Joint Review Panel for the Mackenzie Gas Project (JRP). The EIS addresses the biophysical and human environment aspects of the project, including this application.

TYPES OF UNDERTAKINGS

The undertakings in this application include:

- water use and treated water deposits related to consumption at two stationary construction camps

- water use and deposits related to developing and maintaining winter access roads to infrastructure sites, borrow sites, and a travel lane in the pipeline right-of-way (travel lane)
- potential treated water deposits related to water used for hydrostatic testing of the pipelines and various pressure vessels and tanks at the Inuvik area facility

The proposed undertakings fall under the industrial, municipal, and miscellaneous classifications in Schedule II of the *Northwest Territories Waters Regulations* (NWTR). Some meet the criteria specified for Type A while others are within the thresholds for Type B licences. These thresholds are specified in schedules IV, VI and VIII.

Certain undertakings will take place on lands that are in a designated conservation zone (Travaillant Lake, Mackenzie/Tree River) in the *Nahn' Geenjit Gwitr'it Tigwaa'in, Working for the Land – The Gwich'in Land Use Plan*, dated August 2003 (Gwich'in land use plan). An application for an exception to the Gwich'in land use plan has been submitted to the GLUPB for the related water source and access development activities and operations.

Planned Applications

Various activities requiring a Type B water licence are not included in this application. Examples include:

- pipeline and road crossings of watercourses that are five metres or more in width at the ordinary high water mark at the point of construction
- watercourse training measures, such as bank alterations, culverts, and erosion control

Undertakings pertaining to such activities will be included in a future application to the Board.

TITLE	GSA Application for a Type A Water Licence
SECTION	1: Introduction
SUBJECT	2: How to Use This Document

GUIDE TO THE APPLICATION

The contents of this document are structured by sections, with subjects in each section. These subjects are further divided into topics. Sections and subjects are listed in the [Contents](#).

Definitions

For the purposes of this application, the proposed development activities in the GSA are defined as follows:

- Pipeline Segments – These are segments of the gathering, natural gas liquids (NGLs), and gas pipelines that have been numbered consecutively from north to south, based on land ownership, and include Crown or "C" segments 1 to 4 and private or "P" segments 1 and 2 in the GSA.
- Pipeline Appurtenances – These include above- and below-ground components required for pipeline operations, including valves, cathodic protection devices, pigging facilities, communications and signage.
- Facility Sites – These include gas and NGL processing facilities, metering and custody transfer stations, compressor and pump stations, and heater stations. In the GSA, the only facility required for the project is the Inuvik area facility, a gas and NGL processing facility located near Inuvik.
- Borrow Sites – These are areas that might be excavated to provide material for use elsewhere and include sand and gravel pits and rock quarries. Fifteen borrow sites have been identified for the GSA.
- Infrastructure – These are the temporary and permanent developments that support construction and operation of the project. In the GSA, this includes the construction camps, stockpiles, and fuel storage areas that will be installed at the Inuvik area facility and the Campbell Lake infrastructure site, as well as access roads and water source developments.

Application Sections and Structure

The sections in this application are summarized next.

Introduction – Section 1

This section outlines the purpose of the project and how to use this document. It also provides an overview of the project including descriptions of the anchor fields, gathering system, pipelines and connection to the gas transmission system in Alberta.

Application – Section 2

This section contains the Board's water licence application form with information specified in the *Guide to Completing Water License Permit Applications to the Mackenzie Valley Land and Water Board* dated October 2003 (the Guidelines).

Overview of Activities in the Gwich'in Settlement Area – Section 3

This section provides an overview of activities within the GSA on private and Crown lands, including the potential biophysical and human environment effects of development. Overview information is outlined in the site-specific sections. Typical drawings, schematics and photographs are provided.

Water Use for Access Roads – Section 4

This section describes the activities required to develop and maintain winter access roads to the pipeline rights-of-way, borrow sites, infrastructure and facility sites, and water sources. It describes the proposed activities, estimates the quantities of water required, and includes site-specific maps.

Water Use for the Pipeline Right-of-Way Travel Lane – Section 5

This section addresses the development and maintenance of a travel lane for construction traffic within the pipeline rights-of-way. Right-of-way alignment maps are included, water sources are identified, and the estimated water requirements are provided.

Water Use for Pipeline Pressure Testing – Section 6

This section describes the operations associated with pressure testing the pipelines and pressure vessels in the GSA. The water for the tests is expected to be obtained from sources outside the region. Options for handling and disposing of pressure test water are also described.

Site-Specific Water Use – Section 7

This section covers domestic use requirements at the infrastructure sites that will be required in this region. It contains site-specific maps and includes an estimate of the annual and daily quantities of water that will be required.

Environmental and Resource Effects – Section 8

This section provides a regional description of the biophysical and human environment baseline setting, potential effects and primary mitigation strategies associated with the development.

Access Agreement Summary – Section 9

This section outlines land access arrangements with landowners to secure access rights for the land required for the development.

Public Involvement – Section 10

This section covers the processes used to obtain and consider input from communities and other stakeholders that might be affected by the development. It also describes how public concerns were accommodated in the proposed development activities.

Management Plans – Section 11

This section describes the emergency response and spill contingency plan, the waste management plan, the environmental protection plan and the heritage resource protection plan.

References

This section contains a list of the references cited.

Glossary

This section contains definitions, abbreviations, and acronyms for terms used in this application.

Appendices

This section contains detailed calculations of water requirements ([Appendix A – Calculation of Water Requirements](#)), the land use designation under the Gwich'in land use plan for the proposed sites ([Appendix B – Land Use Designation of Proposed Development Activities](#)), and foldout maps for the development ([Appendix C – Foldout Maps](#)).

Headings with “Part XX” Designations

Several headings in this application include a “Part XX” designation in parentheses. This designation refers to a numbered heading in the Board’s application form for water licences. The material under these headings expands upon information provided in the form in Section 2.

Overview Maps

The legends in the overview maps in [Section 2](#) and [Section 3](#) include symbology for private settlement lands. All other lands, including Crown lands, are not identified with a specific symbol in the legends.

TITLE	GSA Application for a Type A Water Licence
SECTION	1: Introduction
SUBJECT	3: Mackenzie Gas Project

INTRODUCTION

This subject describes the Mackenzie Gas Project and sets the context for more detailed descriptions of the activities and developments proposed in this application.

PURPOSE

The purpose of the project is to develop three anchor fields in the Mackenzie Delta and to transport natural gas and NGLs by pipeline to market. It has also been designed to accommodate gas and NGLs from other sources in the Mackenzie Delta and Mackenzie Valley.

The project will involve:

- constructing and operating wells and natural gas field development facilities at Niglintgak, Taglu, and Parsons Lake, including:
 - well pads
 - flow lines
 - gas conditioning facilities
- developing infrastructure to support construction and operations activities, including:
 - barge landing sites
 - camps
 - stockpile sites
 - fuel storage sites
 - access roads
 - airstrips and helicopter landing areas
 - borrow sites
 - water sources for camps and construction purposes
- constructing and operating a gas processing and NGL separation facility near Inuvik (the Inuvik area facility)
- constructing and operating pipelines and associated pipeline facilities, including compressor stations, a heater station, valving, metering, pigging, and cathodic protection facilities

- connecting with the Enbridge Pipelines (NW) Inc. pipeline near Norman Wells at an interconnection facility to be built by Enbridge under separate regulatory authorization
- connecting with an extension of the NOVA Gas Transmission Ltd. (NGTL) system at an interconnection facility to be built by NGTL in Alberta, under separate regulatory authorizations
- operating and maintaining the pipelines, related pipeline facilities, and infrastructure while there is economic gas production available
- decommissioning and abandoning project components at the end of their operating lives

Figure 1-1 shows the project components in the production area. Figure 1-2 shows the project components along the NGL and gas pipeline corridor. These components are summarized in the table at the end of this section and in the foldout map in Appendix C.

PROJECT PHASES

Project Definition

Project definition began in January 2002 and is expected to conclude in 2006. Activities include:

- consulting with the public, which will continue during the project life
- completing conceptual and preliminary engineering design
- conducting biophysical and human environmental studies and assessments
- developing access agreements and benefits plans
- developing and submitting applications for approval by regulatory agencies
- participating in the regulatory review process

The conclusion of the project definition phase will be marked by a decision as to whether to proceed with construction. This decision will be based on factors such as:

- the terms and conditions of regulatory approvals
- estimated project costs
- the outlook for natural gas markets

Design and Construction

Detailed design and construction are expected to take three years and are scheduled to begin in 2006 and be substantially complete in 2009, with construction cleanup, demobilization, and reclamation continuing through 2010. Activities include:

- continuing public consultation
- completing detailed engineering design
- purchasing goods and services
- developing and constructing infrastructure sites such as borrow sites
- drilling wells at the anchor fields
- constructing production facilities and flowlines at the anchor fields
- constructing the pipelines and associated pipeline facilities
- commissioning and starting up the facilities
- completing construction cleanup and reclamation

During this phase, the project will have the most interaction with the surrounding natural environment and communities. Areas disturbed during construction that will not be used during operations will be reclaimed shortly after construction.

Operations

Operations are expected to begin in 2009. By then, project interaction with the surrounding natural environment and community will have decreased. In addition to community consultation, which will continue in the operations phase, activities include:

- processing raw natural gas and transporting natural gas and NGLs to market by pipeline
- operating and maintaining anchor fields, pipelines and facilities
- undertaking post-construction monitoring and associated remediation
- maintaining production levels by completing additional drilling and the installation of compression facilities at Parsons Lake and Taglu.

Operations are expected to continue while there is economic gas production in the region.

Developing other natural gas fields in the Mackenzie Delta and Mackenzie Valley might extend the life of the project.

Future Expansion

Options to expand the gathering pipeline capacity include looping parts of laterals, installing new laterals to the Inuvik area facility or constructing additional facilities.

Installing intermediate compressor stations would expand the capacity of the gas pipeline. At full expansion, 10 additional stations would be required. The average spacing between these stations would be about 80 km.

Figure 1.1 has been moved to reduce file size. To view it, click on the link to the figure in the web page List of Figures for this document.

Figure 1.2 has been moved to reduce file size. To view it, click on the link to the figure in the web page List of Figures for this document.

Installing intermediate pump stations would expand the capacity of the NGL pipeline. At full expansion of the gas pipeline, two intermediate pump stations would be required to meet corresponding NGL flow rates. These pump stations would be located on the same sites as future compressor stations.

Future expansions will be the subject of subsequent applications.

Decommissioning and Abandonment

Decommissioning and abandonment will begin after the facilities are no longer required for construction or operation of the project.

Decommissioning and abandonment activities will be completed according to the regulatory requirements at the time. Surface facilities and infrastructure might be removed and surfaces, other than granular pads, reclaimed. Alternative uses for the sites being abandoned and reclaimed will be considered.

PROJECT SCHEDULE

Once regulatory approvals have been received, the decision as to whether to proceed with construction can be made. The proposed construction activities could begin in 2006 and be substantially complete in 2009, with construction cleanup, demobilization and reclamation continuing through 2010.

A preliminary construction plan for the project divides pipeline construction into five construction spreads for each year of construction. These spreads vary in length and are summarized in [Table 1-1](#).

Table 1-1: Location and Length of Pipeline Construction Spreads

Construction Zone	Year of Construction	Segment From	Segment To	Length (km)	Nominal Pipe Size
E	1	Niglintgak	Taglu	16	16
	1	Taglu	Storm Hills pigging facility	81	26
	1	Parsons Lake	Storm Hills pigging facility	27	18
	2	Storm Hills pigging facility	Inuvik area facility	52	30
	2	Inuvik area facility	Crossing Creek Lake	95 (two pipelines)	30, 10
D	1	Crossing Creek Lake	Little Chicago	106 (two pipelines)	30, 10
	2	Little Chicago	Fort Good Hope	124 (two pipelines)	30, 10

Table 1-1: Location and Length of Pipeline Construction Spreads (cont'd)

Construction Zone	Year of Construction	Segment From	Segment To	Length (km)	Nominal Pipe Size
C	1	Fort Good Hope	Norman Wells	147 (two pipelines)	30, 10
	2	Norman Wells	Little Smith Creek	147	30
B	1	Little Smith Creek	Ochre River	137	30
	2	Ochre River	Camsell Bend	150	30
A	1	Camsell Bend	McGill Station	157	30
	2	McGill Station	NGTL interconnect facility	157	30

Reclamation and mitigation measures implemented during construction will be monitored for a specific period after construction, or as specified by regulatory approval conditions. Long-term monitoring programs will be established, as required, for areas with environmental, geotechnical, and pipe integrity issues.

PROJECT COMPONENTS

The proposed pipeline corridor, including the gathering and transmission pipelines, is about 1,396 km long. It extends through the ISR, the GSA, the Sahtu Settlement Area (SSA) and the Deh Cho Region (DCR) and crosses the boundary between the Northwest Territories and Alberta.

Table 1-2 provides a list of the major project components. A percentage for each of these components, in each region, is also provided in the table.

Table 1-2: Major Project Components

Project Component ^a	Total Project Requirements ^b	ISR (%)	GSA (%)	SSA (%)	DCR (%)
Pipeline right-of-way length	1,396 km	13	13	37	37
Pipeline land requirements (permanent)	6,020 ha	11	15	39	35
Facility land requirements (permanent)	96 ha	4	50	22	24
Temporary land requirements	9,810 ha	12	11	48	29
Watercourse crossings	666	18	19	39	24
Water requirements	7,000,000 m ³	47	8	23	22

Table 1-2: Major Project Components (cont'd)

Project Component^a	Total Project Requirements^b	ISR (%)	GSA (%)	SSA (%)	DCR (%)
Barge Landing sites (new and upgraded)	11	9	0	45	46
Construction camps (new and upgraded)	18	11	11	34	44
Stockpile sites (new and upgraded)	23	13	9	35	43
Fuel storage sites (new and upgraded)	21	10	10	38	42
Project access roads	972 km ²	15	17	41	27
Airstrips (new and upgraded)	6	17	0	33	50
Borrow pits and rock quarries (existing and new)	127 ²	12	12	43	33
<p>NOTES:</p> <p>^aNumbers in this table include developments within municipal boundaries and on Commissioner's lands.</p> <p>^bIn addition to the requirements shown on this table, about 15 m, or 0.06 ha, of pipeline right-of-way will be required by the project in Alberta.</p>					