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TITLE	<b>ISR Application for a Type A Water Licence</b>
SECTION	1: Introduction
SUBJECT	1: Purpose

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## **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 discharges associated with construction and operation of the ISR development in the Inuvialuit Settlement Region (ISR).

The ISR development, and other activities within the ISR, are defined as follows:

- ISR development: land use activities that pertain to the gathering pipeline segments, pipeline appurtenances and facilities, borrow sites and other infrastructure that will be required in the ISR on Crown and private land for the Mackenzie Gas Project (the project)
- ISR Crown development: land use activities that pertain to the gathering pipeline segments, pipeline appurtenances and facilities, borrow sites and other infrastructure that will be required in the ISR on Crown land for the project
- ISR private development: land use activities that pertain to the gathering pipeline segment, pipeline appurtenances, borrow sites and other infrastructure that will be required in the ISR on private land for the project
- ISR KIBS development: land use activities that pertain to the gathering pipeline segments, pipeline appurtenances and other infrastructure that will be required for the project in the ISR on Crown land within the Kendall Island Bird Sanctuary (KIBS)

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:

- land use permit, water licence and other applications to INAC, the ILA, the NWTWB and other regulators to support construction and operation of the three anchor fields
- applications to the National Energy Board (NEB) to permit the construction and operation of three anchor fields, a gathering system and a natural gas pipeline

- other land use and water licence applications to the Mackenzie Valley Land and Water Board (MVLWB) 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 Board for land and water use activities related to the ISR development
- application to the Canadian Wildlife Service (CWS) for a Canadian Wildlife Service Permit, Bird Sanctuary Permit – Multi-Year

Imperial will apply for the permits and approvals listed in [Table 1-1](#).

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.

**Table 1-1: Permits and Approvals to be Applied for by Imperial**

Regulator	Development	Legislation	Region	Permit
NEB	Gathering system <sup>a</sup>	Canadian Oil and Gas Operations Act	ISR, GSA, SSA	Approval of development plan
NEB	Natural gas transmission pipeline	National Energy Board Act	GSA, SSA, DCR	Certificate of Public Convenience and Necessity
MVLWB	Natural Gas Liquids gathering pipeline, Inuvik area facility and gas transmission pipeline	Mackenzie Valley Resource Management Act	GSA, SSA, DCR	Land use permit and water licences
ILA	ISR private development	Inuvialuit Final Agreement	ISR	Land use permit
INAC	ISR Crown development	Territorial Lands Act	ISR	Land use permit

**Table 1-1: Permits and Approvals to be Applied for by Imperial (cont'd)**

Regulator	Development	Legislation	Region	Permit
CWS	ISR KIBS development	Migratory bird sanctuary regulations	ISR	Canadian Wildlife Service Permit, Bird Sanctuary Permit – Multi-Year
Federal and territorial departments and agencies	Pipeline and gathering system	Various	ISR, GSA, SSA, DCR	Supporting permits, licences and approvals
NOTE: <sup>a</sup> The gathering system consists of the gathering pipelines in the ISR, the Inuvik area facility and the natural gas liquid transmission line.				

## TYPES OF UNDERTAKINGS

The undertakings in this application include:

- water use and treated water discharges related to consumption at two stationary construction camps and watercourse crossings
- water use and discharges 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 water use and treated water discharges related to water used for pressure testing of the pipelines

The proposed undertakings fall under the industrial, municipal, and miscellaneous classifications in Schedule II of the *Northwest Territories Waters Regulations* (NWTWR). 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.

## 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 separate application to the Board.



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TITLE	<b>ISR Application for a Type A Water Licence</b>
SECTION	1: Introduction
SUBJECT	2: How to Use This Document

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## 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

The water use associated with the ISR development excludes the anchor field activities. For the purposes of this application, the proposed ISR development activities are defined as follows:

- Pipeline Segments – These are segments of the gathering pipelines that have been numbered consecutively from north to south, based on land ownership, and include Crown or "C" segments 1 to 5 and one private or "P" segment in the ISR.
- 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 ISR, facilities include the Storm Hills pigging facility and receipt meter stations located at Niglintgak, Taglu and Parsons Lake gas conditioning facilities.
- 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 ISR.
- Infrastructure – These are the temporary and permanent developments that support construction and operation of the project. In the ISR, this includes the construction camps, stockpiles, and fuel storage areas that will be installed at Swimming Point and the Storm Hills pigging facility as well as winter 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 a completed Board water licence application form.

## **Overview of Activities in the Inuvialuit Settlement Region – Section 3**

This section provides an overview of activities within the ISR 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 Lanes – 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 gathering pipelines in the ISR. Options for handling and discharging 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 ISR development. It also describes how public concerns were accommodated in the proposed ISR 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 management category designation under the ISR Community Conservation Plans for the proposed sites ([Appendix B – Land Management Category Designation of Proposed Development Activities](#)), and foldout maps for the ISR 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.

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TITLE	<b>ISR Application for a Type A Water Licence</b>
SECTION	1: Introduction
SUBJECT	3: Mackenzie Gas Project

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## 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 the 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 1-2](#).

**Table 1-2: 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

**Table 1-2: Location and Length of Pipeline Construction Spreads (cont'd)**

Construction Zone	Year of Construction	Segment From	Segment To	Length (km)	Nominal Pipe Size
D	1	Crossing Creek Lake	Little Chicago	106 (two pipelines)	30, 10
	2	Little Chicago	Fort Good Hope	124 (two pipelines)	30, 10
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 Gwich'in Settlement Area (GSA), the Sahtu Settlement Area (SSA) and the Deh Cho Region (DCR) and crosses the boundary between the Northwest Territories and Alberta.

[Table 1-3](#) 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 1-3: Major Project Components**

<b>Project Component<sup>a</sup></b>	<b>Total Project Requirements<sup>b</sup></b>	<b>ISR (%)</b>	<b>GSA (%)</b>	<b>SSA (%)</b>	<b>DCR (%)</b>
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 <sup>3</sup>	47	8	23	22
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 <sup>2</sup>	15	17	41	27
Airstrips (new and upgraded)	6	17	0	33	50
Borrow pits and rock quarries (existing and new)	127	12	12	43	33
<p>NOTES:</p> <p><sup>a</sup>Numbers in this table include developments within municipal boundaries and on Commissioner's lands.</p> <p><sup>b</sup>In addition to the requirements shown in this table, about 15 m, or 0.06 ha, of pipeline right-of-way will be required by Imperial in Alberta.</p>					