
TITLE	ISR Crown Lands Application for a Class A Land Use Permit
SECTION	3: Overview of Activities in the ISR
SUBJECT	1: Regional Overview

PURPOSE

This section describes the proposed activities and gathering pipeline components associated with the ISR development, excluding the anchor fields. It applies to the construction and operation phases, and contains typical drawings, artist's impressions, and photographs.

An introduction to the biophysical and human environment setting is also included in this section, as is a discussion of primary mitigation strategies to reduce potential effects or development concerns that might be associated with the project.

SUMMARY OF REGIONAL ACTIVITIES

A one-kilometre wide corridor has been identified for the gathering pipelines through the ISR. Within this corridor, proposed pipeline routes have been identified that extend about 175.2 km in the ISR to the GSA boundary.

Development Activities

As shown in [Figure 3-1](#), the proposed ISR development will involve constructing and operating:

- 15.7 km of NPS 16 gathering pipeline in a 30 m wide right-of-way of the Niglintgak lateral
- 81.4 km of NPS 26 gathering pipeline in a 40 m wide right-of-way of the Taglu lateral
- 26.5 km of NPS 18 gathering pipeline in a 30 m wide right-of-way of the Parsons Lake lateral
- 51.6 km of NPS 30 gathering pipeline in a 40 m wide right-of-way of the Storm Hills lateral
- the Storm Hills pigging facility
- receipt meter stations
- pipeline appurtenances, such as valves and cathodic protection, at nine sites

New permanent gathering pipeline rights-of-way will be required for about 23.6 km of Inuvialuit private lands and about 151.6 km of Crown lands. An estimated 90.7 ha of additional temporary workspace will also be needed for construction purposes, including about 19.6 ha on Inuvialuit private lands and 71.1 ha on Crown land. These estimates do not include workspace for bypass areas, which will be determined as engineering and construction planning progresses.

To support the proposed gathering pipeline construction and operations activities in the ISR, various new infrastructure developments will be needed, including:

- a stationary camp, stockpile, fuel storage and helipad at the Storm Hills pigging facility and a temporary infrastructure site at Swimming Point
- 55 winter access roads totaling about 149.2 km of new access (85.0 ha on private land and 213.4 ha on Crown land)

Borrow Sites

To support construction activities in the ISR, a total requirement of about 1,332,000 m³ of borrow material has been estimated, including the quantity required by the three anchor field owners. Imperial will be developing some borrow sites on their behalf. Fifteen borrow sites have been identified for potential development. Seven are on Inuvialuit private lands and eight are on Crown lands. Together, these sources could provide about 35,780,000 m³ of exploitable borrow materials. The borrow sites, a selected part of the borrow sources, could provide about 1,816,000 m³.

Existing Infrastructure

In addition to the proposed development activities, existing services and transportation infrastructure in the ISR will be used where practical and with permission as required. This includes a barge landing, air strip and bulk fuel storage facilities at Swimming Point. Existing Government of the Northwest Territories winter roads will also be used.

Water Requirements and Sources

An estimated 3,272,100 m³ of water will be needed in the ISR for construction purposes (see [Table 3-1](#)). These requirements are addressed in the Type A water licence application to the Northwest Territories Water Board.

The water will be used to build and maintain winter access roads and right-of-way travel lanes, for domestic purposes at the camps, for horizontal directional drilling activities at selected watercourse crossings and potentially for gathering pipeline pressure testing.

A final pressure testing decision has not been made regarding the test medium. A water-freeze depressant mixture has been assumed for this application.

Water will normally be transported by truck to sites from nearby lakes and rivers.

Table 3-1: Estimated Water Requirements in the ISR

Purpose	Estimated Annual Quantity (m ³)	Total Estimated Quantity (m ³)
Winter Access Roads	285,500	856,500
Pipeline Right-of-Way	780,000	2,340,000
Camp Water	29,950	60,200
Horizontal Directional Drilling	N/A	10,900
Pipeline Pressure Testing	N/A	4,500
Total	1,095,450	3,272,100

About 34 potential water sources are being investigated in the ISR, including 24 on Crown land and 10 on private land (see [Figure 3-2](#)). Their location, by gathering pipeline lateral, is provided in [Table 3-2](#). Some can be accessed from several points on the gathering pipeline rights-of-way. The largest potential sources include the Mackenzie River, Yaya Lake, Noell Lake and Parsons Lake.

Table 3-2: Location of Potential Water Sources in the ISR

Location	
Gathering Pipeline Lateral	Number of Sources
Niglintgak Lateral	3
Taglu Lateral	21
Parsons Lake Lateral	4
Storm Hills Lateral	6

Water Use and Deposits

As stated previously, water will be obtained from the Mackenzie River and various lakes in the ISR for building winter access roads, the gathering pipeline travel lanes and temporary work platforms.

No additives or treatment of the water will be required for building the winter access roads, travel lanes and work platforms. The water will be trucked to the sites and used to help freeze and form the travel or work surface. In spring, the ice and snow will melt and flow into the surrounding natural drainage system. Any fuel spills will be immediately handled in accordance with the spill contingency

plan (SCP). The collected materials will be managed in accordance with the SCP and with applicable regulatory requirements (see [Section 11](#)).

Water will be required for domestic purposes at the Storm Hills pigging facility and the Swimming Point infrastructure site.

Domestic wastewater from the camps will be treated to meet the appropriate regulatory standards. Camp sewage will either be treated onsite or transported to an approved off-site location, in compliance with the applicable environmental and health standards. Off-site transport and disposal of sewage will occur primarily when smaller staffing requirements exist, such as during the operations phase.

In the event that water is used for pressure testing the gathering pipeline laterals, it is expected that the water will be obtained from sources within the ISR. This water will be mixed with a freeze depressant. After the tests are completed, the freeze depressant will be separated from the water or the mixture will be salvaged or disposed of in an environmentally appropriate manner. A number of alternatives are being investigated for disposal, including recycling, deep well injection or flaring.

Treated wastewater might be used for winter road maintenance.

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Figure 3.2 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.

TITLE	ISR Crown Lands Application for a Class A Land Use Permit
SECTION	3: Overview of Activities in the ISR
SUBJECT	2: Project Setting

SETTING FOR PROJECT ACTIVITIES IN THE ISR

This subject provides a summary of the regional biophysical and human environment setting for the development activities that will occur in the ISR. Detailed regional information is provided in [Section 8](#).

Biophysical Setting

The biophysical information in this topic incorporates information from desktop studies and field investigations in 2002, 2003, and 2004. The desktop studies included a review and analysis of available literature, government data, aerial photos, and satellite imagery. The field surveys were conducted along the gathering pipeline routes, at the proposed Storm Hills pigging facility site, and at the Swimming Point infrastructure site. Air quality monitoring and sound level surveys were also undertaken at certain locations (see [Section 8](#) for regional data and sections 4, 5, 6 and 7 for site-specific information).

Climate

The gathering pipeline corridors through the ISR are located within a 150 by 200 km area designated as the northern air shed.

Average annual temperatures range from -10.5°C in Tuktoyaktuk to -9.1°C in Aklavik. Temperature extremes have ranged from -52.2°C in the winter to 33.9°C in summer. Total normal annual precipitation ranges from 142.1 mm in Tuktoyaktuk to 207.8 mm in Aklavik.

Noise

The acoustic environment around the proposed development in the ISR is dominated by the sounds of nature. Surveys near the proposed Niglintgak production facility site indicate sound levels were typically between 20 and 30 dBA when winds were less than 10 km/h. There is no industrial presence within audible distance of any project site.

Soils, Landforms and Permafrost

The area covered by this application is within the Tundra ecological zone. Surficial deposits in the Parsons Lake area and along most of the gathering pipeline are composed primarily of hummocky moraine with minor amounts of glaciofluvial material.

Moraine is found in upland areas and is predominantly clay and silt-rich tills. Lowland areas commonly develop low-centred polygons and, more rarely, pingos. Active geomorphic processes include thermokarst and retrogressive thaw-flow slides.

Recent reclassifications (Heginbottom 2000) describe the outer delta area and portions of Richards Island as featuring intermediate discontinuous permafrost with about 35 to 65% permafrost beneath the area. In the Mackenzie Delta, permafrost thickness is generally less than 90 m thick, where present, and contains deep unfrozen zones (taliks), which in some cases extend to the base of the permafrost (through taliks). The depth of the active layer generally ranges from 30 to 100 cm.

Low ice content is expected in well-drained, coarse-grained sediments above the local groundwater table, such as glaciofluvial sand and gravels. Massive ice might be contained in granular deposits at depths below about seven metres, in some localized areas. Ice-rich permafrost is more commonly associated with fine-textured moraine, lacustrine sediments, organic soils, and fluvial deltaic sand deposits. The ice content might be very high if the deposits are located in poorly drained areas. Ice veins, lenses and massive ground ice are common.

Vegetation

The study area in the ISR falls within the Tundra ecological zone. Topography is fairly level, rising from sea level in the delta to 150 m in elevation near Parsons Lake. Vegetation grows on a veneer of nonfrozen organic or granular substrate overlying the permafrost boundary. In wetter areas, sedges, cotton-grasses and sphagnum moss dominate high- and low-centred polygons. Drier areas support ericaceous shrubs. Riparian communities include wet sedge communities and taller shrubs. Holmes Creek and Hans Creek support outliers of black spruce. The floodplain of the Mackenzie River is dominated by shrub communities and wet sedge – cotton-grass meadows.

Twelve vegetation types found in the Tundra ecological zone have been identified within the study area and include:

- dry saxifrage tundra
- dwarf shrub heath
- upland shrub
- cotton-grass tussock
- high-centred polygons
- low-centred polygons
- riparian shrub
- riparian sedge – cotton-grass
- delta shrub
- delta sedge – cotton-grass

- delta low-centred polygons
- riparian black spruce and shrub

Sites that might support uncommon vegetation communities in the ISR include:

- exposed beaches of various substrates
- edges of riparian areas
- small eroding slopes and slumps
- balsam poplar stands
- snowmelt patches
- exposed granular substrates
- littoral zones of shallow lakes
- fluvial communities

Within the ISR study area, six rare plant species were observed:

- alternate-flowered water milfoil (*Myriophyllum alterniflorum*)
- Arctic seashore willow (*Salix ovalifolia* var. *arctolitoralis*)
- Chamisso's willow (*Salix chamissonis*)
- weak sedge (*Carex laxa*)
- wedgeleaf willow (*Salix sphenophylla*)
- Yukon stitchwort (*Minuartia yukonensis*)

Arctic seashore willow, Chamisso's willow and weak sedge are ranked *critically imperilled* for the Northwest Territories because of their extreme rarity. Arctic seashore willow is a nationally rare species that is endemic to Canada. The other three species are *reported* in the Northwest Territories.

Wildlife

The ISR is home to about 33 species of mammals, including ungulates, large carnivores, furbearers and small mammals. Characteristic species in the study region include barren-ground caribou, grizzly bear, gray wolf, Arctic fox, wolverine and Arctic ground squirrel. Some species have special status in the ISR. Special status refers to various levels of endangerment as identified by territorial and national institutions. Special status species include the grizzly bear (northwestern population), wolverine, river otter and polar bear.

The flat, low-lying outer delta floods annually and supports only a few mammal species. Inland, the landscape is characterized by rolling topography with numerous small lakes and watercourse channels. Dwarf shrubs and cotton-grass tussocks dominate the landscape; however, outlying pockets of taiga (open black spruce forest) occur in river valleys such as at Holmes Creek. This valley provides important winter habitat, including food, cover and thermal protection, for a number of wildlife species. The valley also supports several species, such as Canada lynx and red squirrel, which do not occur in other tundra habitats.

About 120 species of birds, including waterfowl, raptors, shorebirds and passerines, nest in the ISR study area. The majority of these species are migrants, but about 15 species occur as year-round residents. Species at risk include the peregrine falcon, short-eared owl and golden eagle.

The ISR contains several important areas for birds. The Mackenzie Delta is recognized as a key migratory bird breeding and staging site in the Northwest Territories. The abundant mudflats, shallow bays, sedge meadows, shrub and cotton grass-tussock habitats within the delta are used annually by thousands of staging, nesting, breeding and moulting waterfowl and waterbirds, including ducks, swans, geese, loons, cranes, shorebirds, seabirds and gulls. There are notable concentrations of moulting and brood-rearing lesser snow geese, Canada geese, greater white-fronted geese and tundra swans near Kendall Island and elsewhere along the coast of the outer delta. The outer Mackenzie Delta also provides nesting habitat for shorebirds. Many of the waterfowl species and some waterbirds are important food sources for local residents.

Within the Mackenzie Delta, the Kendall Island Bird Sanctuary (KIBS) was established in 1961 to protect waterfowl breeding and staging grounds. This 600 km² sanctuary provides habitat for over 80 species of migratory birds, including up to 7,500 nesting snow geese. Tundra swans, greater white-fronted geese, sandhill cranes, brant, dabbling ducks, and shorebirds also nest and moult within the sanctuary. In addition, several species of raptor, passerine and ground-dwelling birds are present in the area.

Hydrology

The Mackenzie River basin contains the longest drainage system in Canada.

There are four large channel and nine Active I watercourses that will be crossed by gathering pipelines in the ISR. The largest watercourses in the area are the Kanguk Channel, Kuluarpak Channel, East Channel, Harry Channel and Aklak Channel. Very small Arctic drainages are crossed by the gathering pipeline laterals in the ISR. Flow in these watercourses is usually restricted over the winter period by freeze-to-bottom conditions.

Most watercourses (about 82%) crossed by the gathering pipeline laterals within the ISR are vegetated waterways with either an undefined drainage path or dispersed flow through small shrubs or trees.

Groundwater

In an area of continuous permafrost, which typifies most of the study area within the ISR, ground water contributions to streamflow are limited and seasonal, with no or negligible contributions made in winter.

No evidence of perennial springs was found in the ISR study area, nor was any evidence found of groundwater inflow that would maintain winter stream flow. Open water and icings observed near the outlet from Noell Lake and along an associated stream are attributed to lake storage rather than groundwater inflow.

Seasonal springs and seepages occur at retrogressive thaw flow slides throughout the area. The water outflow at these locations is fed by ice melt-out from the active layer and melting of permafrost exposed at the slides. Flow is expected to cease shortly after winter freeze up. A small lake located close to Parsons Lake is reported to remain open in the winter. This lake might be fed by a talik through subpermafrost groundwater. Gas bubbling up through the lake water might be derived from an underlying natural gas reservoir.

Water Quality

Waterbodies along the proposed gathering pipeline routes through the ISR fall within the Mackenzie Delta. The waters of the delta typically are moderately coloured and have high total suspended solids (TSS) levels in delta channels and low TSS levels in lakes near Niglintgak, Parsons Lake and Taglu. These parameters are influenced by the discharge regime. For example, turbidity and colour tend to be low over the winter, highly variable in spring, and peak over the summer. Conversely, conductivity and TSS concentrations are highest in the winter and decline in the open water period.

Fish and Fish Habitat

The Mackenzie River and its tributaries throughout the ISR support both diadromous and resident fish species. About 31 species of fish are potentially present in ISR watercourses. Of these species, nine spawn in the fall. These include the salmonid species, except arctic grayling. Fall spawning generally occurs in larger watercourses with perennial flow. Spring spawning is typically in smaller tributaries and can occur in intermittent or ephemeral drainages.

HUMAN ENVIRONMENT SETTING

This topic discusses various aspects of the human environment in the ISR, including traditional culture, heritage resources, logistics, employment, the economy, infrastructure, and community services. It includes feedback from the public involvement program, interviews and a review and analysis of available literature and government data. A detailed discussion is provided in [Section 8](#).

People and the Economy

The ISR is made up of the largely Aboriginal communities of Aklavik in the Beaufort Delta, Tuktoyaktuk and Paulatuk on the Beaufort Sea Coast, Holman on Victoria Island and Sachs Harbour on Banks Island. Aklavik is also considered to be a Gwich'in community as indicated by the Gwich'in Comprehensive Land

Claim Agreement signed in 1992. Information on Inuvik is included in the project applications for development activities in the GSA. However, Inuvik infrastructure and services are available to ISR residents. Therefore, Inuvik is included in the discussion below.

The 2003 estimated population of the ISR communities was 2,506, including 990 in Tuktoyaktuk. More than 90% of the population in the ISR communities was Aboriginal in 2001, except for Paulatuk, where about 20% of the residents were non-Aboriginal. The Aboriginal population is 95% or more Inuvialuit, except in Aklavik where 24% are Dene and 7% are Metis.

Employment rates in Tuktoyaktuk, Aklavik and Holman generally increased from 1991 to 2001, and unemployment rates also decreased. In 2001, average employment income was about \$30,000 per year in Tuktoyaktuk, \$24,000 in Aklavik and Holman and \$23,000 in Paulatuk. Data is not available for Sachs Harbour.

Community Services

Community wellness, measured in terms of the physical, emotional, social and economic well being of individuals and families in ISR communities, is challenged by a number of issues. These longstanding issues include alcohol abuse, and related violence and illness, smoking, sexually transmitted infections (STIs) and suicides. This places additional burdens on health care, public safety and protection services in the communities.

Inuvialuit communities are served by the Inuvik Regional Health and Social Services Authority (IRHSSA). IRHSSA runs the Inuvik Regional Hospital, a new facility that opened in 2003, and a public health unit. An air ambulance is stationed in Inuvik to ensure rapid response to medical emergencies in the other communities. Community health centers staffed by registered nurses are found in all the ISR communities except Sachs Harbour, which has a health station staffed by a single registered nurse or a community health worker. Services that are not available from the IRHSSA are sought in Yellowknife or outside the Northwest Territories, upon referral of IRHSSA staff.

There are RCMP detachments in Tuktoyaktuk, Aklavik, Paulatuk and Holman. The Inuvik RCMP detachment consists of 12 officers and is responsible for policing Sachs Harbour.

Economic growth in the Mackenzie Delta has created a housing shortage in Tuktoyaktuk. Similar problems have not been recorded in Holman, Paulatuk or Sachs Harbour.

The five ISR communities have kindergarten to grade 12 schools with substantial excess capacity. A range of diploma and certificate courses and programs is offered through Aurora College.

The proportion of the adult population with high school diplomas fell slightly in the ISR between 1994 and 2001 because of graduation rate declines in Tuktoyaktuk and Sachs Harbour. In 2001, 39% of the adults in the five ISR communities were high school graduates.

Physical Infrastructure

Inuvik serves as the transportation hub for communities in the ISR and elsewhere in the Beaufort Delta. Inuvik has scheduled flights, the all-weather but seasonally restricted Dempster Highway, and barge-based re-supply in the summer. Aklavik and Tuktoyaktuk have winter road connections with Inuvik.

All of the Inuvialuit communities have scheduled air service and marine resupply. From mid-July to late September, Northern Transportation Company Limited (NTCL) resupplies the Arctic communities via its staging site at Tuktoyaktuk, using tugs and barges. There is no rail access in any of the Inuvialuit communities.

Water, sewage and solid waste disposal services meeting Government of the Northwest Territories (GNWT) standards are available in the five Inuvialuit communities (GNWT Water Board 1992). Because of the extreme cold temperatures and permafrost, most Inuvialuit communities do not have piped water and sewage disposal to individual homes. Water is delivered to households by truck, and liquid waste disposal is by pumpout from a holding tank or by “honey bags” for which there is scheduled pickup.

Diesel-fuelled generators provide power in the ISR communities. The main heating fuel is P-50 fuel oil.

Traditional Culture

Traditional culture includes the knowledge, skill and discipline required to harvest and survive on the land. Traditional or country foods, the traditional economy, and Aboriginal language use and retention, are important aspects. Within the ISR, survey findings indicate:

- about 54% of the adult population in the Beaufort Delta communities hunted or fished in 2002
- country food represented at least half of the food consumed in 1998 by 72% of the households in the ISR
- Inuvialuit trapping declined between 1987 and 2002. The percentage of men aged 25 to 59 years who trapped fell from 56 to 10%

- fluency in the Aboriginal languages, including Inuvialuktun, declined between 1989 and 1999, with only about 34% of Aboriginal adults in ISR communities excluding Aklavik, and 19% in Aklavik, speaking Aboriginal languages in 1999

Non-Traditional Land and Resource Use

Non-traditional land and resource use within the ISR includes extracting borrow material, and oil and gas exploration activities.

There are no mines or ore deposits of consequence within the development area.

Commercial, domestic and sport hunting activities occur within the ISR, but there is limited information available for harvest numbers and harvest locations in the study area. There is only sporadic use of the study area by resident sport hunters.

Licensed Inuvialuit guides and outfitters lead most land- and water-based tours within the ISR, and charter companies operate air tours. About 16 tour operator companies are based in the Mackenzie Delta area, offering a range of services.

About 12 commercial fishing licences are issued annually within the Inuvik area. Four domestic fishing licences are issued in the ISR for large geographic areas around Inuvik. A domestic fishing licence allows non-Aboriginal people to fish with a net for non-commercial purposes. Common areas for sport fishing include Sitidgi, Noell, Husky, Jimmy and Yaya lakes, and the Yaya River.

Protected Areas

A number of Community Conservation Plans (CCPs) have been prepared within the ISR. Of these, the project study area is within those plans prepared by the communities of Tuktoyaktuk, Aklavik and Inuvik. The CCPs offer guidelines for development activities that reflect the views of hunters, trappers and fishermen in the communities. These guidelines are designed to ensure conservation of renewable resources (Community of Inuvik et al. 2000; Community of Aklavik et al. 2000; Community of Tuktoyaktuk et al. 2000). However, development activities are permitted on the lands covered by the CCPs.

The land use categories identified in the CCP areas range from Category A (lands with no known significant and sensitive cultural or renewable resources) to Category E (lands where cultural or renewable resources are of extreme significance and sensitivity). Land uses within the study area include lands where cultural or renewable resources are of some significance (Category B), of particular significance during specific times of year (Category C) or of particular significance throughout the year (Category D). There are no Category A or E lands within the project study area.

The KIBS (CCP Area 706D) encompasses 606 km² of the Mackenzie River delta, including many flat islands and part of Kendall Island that borders on the Beaufort Sea (Environment Canada 2000). The KIBS provides important habitat for waterfowl and shorebirds. This site is managed by the Canadian Wildlife Service in cooperation with local communities and regional Aboriginal organizations, under the *Migratory Birds Act* (Northwest Territories Protected Areas Strategy Advisory Committee 1999). As stipulated in the Inuvialuit Final Agreement, Inuvialuit beneficiaries can access the sanctuary, and hunt and trap wildlife within it (Environment Canada 2000). Other types of land use in the KIBS are subject to approval, require a Sanctuary Permit and are only permitted if they are of limited effect. KIBS is the only ISR protected area with additional permitting requirements. There are flight and activity restrictions in the KIBS during June and July.

Heritage Resources

In addition to the previously recorded heritage resources that are in close proximity to the proposed development areas, the 2002 and 2003 heritage resource field programs resulted in the identification of 42 heritage resources in the ISR. These included prehistoric archaeological, historic archaeological and a wide array of cultural sites, including recent campsites, trails, cabins and burials. Palaeontological resources were also identified.

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SUBJECT	3: Project Schedule

SCHEDULE OF PROJECT ACTIVITIES

A preliminary multi-year construction plan has been developed for the project.

The construction schedule incorporates the timing of regulatory approvals described in the Cooperation Plan for the Environmental Impact Assessment and Regulatory Review of a Northern Gas Pipeline Project through the Northwest Territories developed by the Northern Pipeline Environmental Assessment and Regulatory Chairs' Committee.

The preliminary plan assumes three years of construction for the gathering pipelines and associated facilities, followed by construction cleanup, demobilization and reclamation (see [Table 3-3](#)).

The first year involves preparatory activities starting in the summer of 2006. These activities include building the infrastructure needed for construction and clearing the rights-of-way and facility sites.

The second and third years involve completing preparatory activities and constructing the gathering pipelines and associated facilities.

Camp and equipment demobilization, construction cleanup and site reclamation will start in the third year and will be substantially complete in the fourth year.

Most gathering pipeline installation activities will be completed during the winter. Some activities, such as watercourse crossings and borrow site development, might occur in the summer, where access to the work site is practical. Summer activities are critical to the schedule, as these will allow development of infrastructure needed to support winter construction.

Construction plans include the receipt of regulatory approvals, permits, and authorizations in time to begin infrastructure construction in the second half of 2006.

Table 3-3: Pipeline and Facilities Construction Schedule for the ISR

Season	Activity
Summer 2006	<ul style="list-style-type: none"> • Mobilize equipment, small camps and fuel for gathering pipeline rights-of-way clearing. • Mobilize equipment and fuel for initial site development at the Swimming Point site. • Mobilize and install additional camp trailers at the existing Swimming Point camp. • Begin to develop and operate borrow sites. • Begin construction of the Swimming Point infrastructure site.
Winter 2006–2007	<ul style="list-style-type: none"> • Begin surveying, clearing and drilling boreholes, and digging test pits along the gathering pipeline rights-of-way (Spread E1). • Continue developing and operating borrow sites. • Continue constructing the Swimming Point infrastructure site. • Develop infrastructure for HDD sites. • Construct the pad for the Harry Channel and East Channel HDD crossings.
Summer 2007	<ul style="list-style-type: none"> • Install a 950-person pipeline construction camp at the Swimming Point infrastructure site. • Erect fuel facilities at the Swimming Point infrastructure site. • Start mobilizing components for the Storm Hills pigging facility to the staging area. • Mobilize pipe and HDD equipment.
Winter 2007-2008 First pipe-laying season	<ul style="list-style-type: none"> • Continue surveys, clearing and drilling boreholes, and digging test pits along the gathering pipeline rights-of-way (Spread E2). • Continue operating borrow sites. • Construct winter access roads for the Storm Hills pigging facility. • Construct the Storm Hills pigging facility pad. • Mobilize equipment, fuel and the 40-person camp at the Storm Hills pigging facility. • Install pile foundations for the Storm Hills pigging facility. • Transport from staging area and start installing components for the Storm Hills pigging facility. • Begin gathering pipeline construction Spread E1 in the ISR starting at Niglintgak. • Install all HDD crossings for Spread E1. • Begin gathering pipeline right-of-way reclamation.

Table 3-3: Pipeline and Facilities Construction Schedule for the ISR (cont'd)

Season	Activity
Summer 2008	<ul style="list-style-type: none"> • Move-in pipe, equipment and fuel to support main gathering pipeline construction effort. • Continue mobilizing components at the staging area for the Storm Hills pigging facility. • Begin post-construction monitoring.
Winter 2008-2009 Second pipe-laying season	<ul style="list-style-type: none"> • Complete gathering pipeline construction involving Spreads E1 and E2. • Transport from staging area and complete installing components for the Storm Hills pigging facility. • Continue operating borrow sites. • Continue gathering pipeline rights-of-way reclamation. • Begin commissioning and start-up activities for the Storm Hills pigging facility and pipelines.
Summer 2009	<ul style="list-style-type: none"> • Continue commissioning and start-up activities. • Begin infrastructure site and borrow site reclamation. • Continue gathering pipeline rights-of-way reclamation. • Continue post-construction monitoring. • Begin demobilizing construction equipment and camps.
Winter 2009-2010	<ul style="list-style-type: none"> • Complete commissioning and start-up activities. • Start up and begin operating facilities and pipelines. • Continue demobilization. • Continue reclaiming construction equipment and camps. • Complete gathering pipeline rights-of-way reclamation and reclamation of infrastructure sites not required for operations.
Summer 2010	<ul style="list-style-type: none"> • Complete demobilization. • Continue post-construction monitoring.

