

6 NONTRADITIONAL LAND AND RESOURCE USE

6.1 Introduction

6.1.1 Setting

This section describes existing land and resource uses for nontraditional users within the study area. Nontraditional land and resource users in the Mackenzie Valley include:

- non-Aboriginal residents
- nonresident hunters and anglers
- tourists
- government and industry representatives who travel North for business

This section does not include any information on traditional land use or traditional knowledge. Information on resource harvesting is limited to nontraditional harvesting only. See Section 5, Traditional Culture for more information on traditional land and resource use, and traditional knowledge.

6.1.2 Objectives

The objectives of the nontraditional land and resource use baseline study are to:

- collect the most recent available information for all valued components in the study area
- document the existing conditions for all valued components for each settlement region within the study area
- identify and describe all nontraditional land and resource use that could be affected by the project

6.2 Methods

6.2.1 Baseline Information

Baseline information for each valued component was collected from available literature, maps and web sites, and through discussions with resource managers and other knowledgeable individuals living and working in the Mackenzie Valley. Discussions were conducted via phone, e-mail and sometimes in person. Additional information was provided by a fixed-wing flight over the study area in September 2001 and fieldwork conducted by other disciplines, e.g., vegetation, wildlife and aquatics.

6.2.2 Study Area

Study area boundaries ensure that the land and resource uses potentially affected by the project are identified and assessed. The study area for the land and resource use baseline, is defined by a 15-km-wide buffer around the three anchor fields, on each side of the gathering pipelines in the gathering system, and on each side of the gas pipeline right-of-way. This approach resulted in a study corridor about 30 km wide. Although many resource-related activities occur on lands within the study corridor, these lands are more frequently used to access activities outside the corridor. In particular, the winter road from Wrigley to Fort Good Hope is an important access route for all residents of these regions.

In addition, the proposed shipping route for the barge-based Niglintgak processing facility was included in the study area. This proposed route extends from the Tuktoyaktuk area, through Kugmallit and Kittigazuit bays into the Mackenzie Delta, along the Mackenzie River East Channel, Neglek Channel, Middle Channel and, finally, Kumak Channel to the landing site at the south end of Niglintgak Island (see Section 6.3.10, Environmentally Protected Areas).

6.2.3 Baseline Components

For nontraditional land and resource use, baseline components are defined as the valued components upon which the EIS is based. The valued components are land or resource uses, or in some cases, the available resources, that the project could affect, including:

- land ownership
- granular resources
- timber resources
- mineral resources
- oil and gas activities
- nontraditional resource harvesting (hunting and fishing)
- tourism and recreation
- other commercial activities
- marine operations (ISR only)
- environmentally protected areas
- visual and aesthetic resources

In addition to these valued components, a description of the land ownership in each region is also provided. A brief general description of each of the land and resource use valued components in the study area follows.

6.2.3.1 Land Ownership

The lands traversed by the project typically fall into five categories of ownership:

- federal Crown lands – federal lands administered by INAC (also referred to as territorial lands in the *Territorial Lands Act*)
- Commissioner's lands – federal lands administered by the territorial government
- private lands – administered by the land administration within the settlement region
- municipal lands – administered by the territorial government or the municipality
- provincial Crown lands – administered by the Alberta Public Lands Administration

This valued component was chosen because the project will traverse both public and private lands, and permission to use the lands will be required. These lands might be zoned for uses contrary to the project, particularly municipal lands, and this potential for zoning conflict is another reason why land ownership was chosen as a valued component.

6.2.3.2 Granular Resources

Granular resources refer to sand, gravel, clay, quarry materials and silt. Some of these resources will be required for project construction. Granular resources were chosen as a valued component because industrial developments and local communities need these resources for construction and maintenance. These materials are sometimes difficult to obtain in the North.

6.2.3.3 Timber Resources

Although the anchor fields do not contain timber, other segments of the project go through forested lands where timber is important for firewood, construction materials and other uses. The vegetation changes from tundra in the ISR to transitional forest near the ISR–GSA boundary. Farther south, from Travaillant River to northwestern Alberta, the study area is predominantly forested with a mixture of black and white spruce, birch, pine, aspen and tamarack. Land clearing during construction, and an increase in access to forested areas, has the potential to affect available timber resources.

6.2.3.4 Mineral Resources

Mineral resources were chosen as a valued component to assess potential impacts on future potential mineral development, i.e., areas where mineral potential has been found or where mineral leases are held.

6.2.3.5 Oil and Gas Activities

Oil and gas activities include exploration and development for oil and natural gas production outside the scope of the project. Oil and gas activities were chosen as a valued component because of the strong potential for future oil and gas development in the Northwest Territories in general, and specifically in the project area.

6.2.3.6 Nontraditional Resource Harvesting

Nontraditional resource harvesting includes hunting, fishing and trapping pursued by non-Aboriginal residents and nonresidents. These activities may be for domestic, sport or commercial purposes. Nontraditional resource harvesting was chosen as a valued component because of the high level of concern for potential impacts on these activities.

6.2.3.7 Tourism and Recreation

Tourism and recreation activities include ecotourism, guided outfitting, river tours, cultural tours or recreational activities, such as hiking or cross-country skiing. Construction and operation of the project, and what exists after decommissioning, have the potential to affect the nature and levels of these activities.

6.2.3.8 Other Commercial Activities

Other commercial activities include reindeer herding in the ISR, commercial transportation and agriculture. These might occur near the project area. Directly or indirectly, project activities might affect these commercial activities.

6.2.3.9 Marine Operations

The Beaufort Sea is used by a variety of vessels for several different purposes. As the currently preferred development approach at Niglintgak includes transport of a barge-based facility through the Beaufort Sea, marine operations may be affected.

6.2.3.10 Environmentally Protected Areas

The project area is near or within areas with special designations that, through legislation or other means, are protected in some form, or are given special status. These areas include:

- the Kendall Island Bird Sanctuary, a migratory bird sanctuary
- Inuvialuit Community Conservation Plan category areas
- a potential heritage river, i.e., the Mackenzie River
- Gwich'in and Sahtu conservation zones and special management areas
- territorial parks
- proposed and existing protected areas
- International Biological Program sites
- national historic sites
- caribou protection areas
- recreation areas

6.2.3.11 Visual and Aesthetic Resources

Currently, there is little physical presence on the landscape that has an effect on the visual or aesthetic value within the project area. Installation of the project components, particularly the facilities, has the potential to affect visual and aesthetic values.

6.3 Baseline Conditions – Inuvialuit Settlement Region

6.3.1 Land Ownership

Lands traversed by the project in the ISR are either federal Crown lands, administered by INAC, or Inuvialuit private lands, administered by the Inuvialuit Land Administration. Figure 6-1 depicts land ownership in the ISR.

6.3.2 Granular Resources

The most common type of granular material in the ISR is sand and gravel of fair quality used for general fill. Limited amounts of excellent- and poor-quality sand and gravel are also present throughout the region.

The Inuvialuit own granular resources found on Inuvialuit lands with subsurface rights. On all other Inuvialuit lands, i.e., surface rights only, and Crown lands, the granular resources are owned by INAC.

Figure 6.1 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

The Parsons Lake area has been identified as the largest source of granular material in the study area. There are many identified deposits near the gathering pipeline northwest of the Parsons Lake field, including the Yaya Lake eskers located about 15 km northwest of Swimming Point (EBA 1987). According to the terms of the *Inuvialuit Final Agreement*, deposits in the Yaya Lake eskers are dedicated to sand and gravel development.

Two sources of granular materials west of the gathering pipeline were used during construction of the Ikhil pipeline. Materials remaining at these borrow sites could be used as gravel sources for the project.

Potential borrow sites have been identified within Borrow Management Area No. 2, which is centred on Noell Lake (Hardy BBT and Avati Associates 1988). The Inuvialuit Land Administration controls granular deposits within Borrow Management Area No. 2, and therefore availability is restricted.

Exploration for granular materials in the Tuktoyaktuk region has not uncovered any large deposit of quality material close to the community. Many deposits in the Tuktoyaktuk region have been abandoned, either because they have been used up, or the easily accessible materials have already been taken.

6.3.3 Timber Resources

Most of the ISR lies north of the tree line within the tundra ecoregion. Therefore, there are no timber resources sufficient for commercial operation within the study area (World Wildlife Fund 2002; Lewis 2002, personal communication).

Some scrub and transitional forest exists in the southern region of the ISR. Timber harvesting within this area, specifically near Inuvik, is conducted primarily for firewood (Lewis 2002, personal communication).

A portable sawmill (WoodMiser), located in Inuvik, processes small amounts, e.g., 14 to 18 m³, of wood per year for picnic tables and small projects (Lewis 2002, personal communication). The sawmill is used primarily to meet local demands for small construction projects requiring timber.

6.3.4 Mineral Resources

The part of the study area in the ISR has no mines and no identified mineral showings (CS Lord et al. 2002; North of 60 Engineering Ltd. 1993). Known deposits of iron, coal, copper, lead and zinc exist within the Mackenzie estuary area. However, these have yet to be developed (Mackenzie Delta–Beaufort Sea Regional Land Use Planning Commission 1991). Currently, there are no identified plans for developing these deposits.

There has been extensive diamond exploration in the ISR. However, these activities are located outside of the study corridor.

6.3.5 Oil and Gas Activities

To date, the only oil or gas field developed in the Mackenzie Delta–Beaufort Sea region has been the onshore Ikhil field (Brackman 2000, 2001; Dietrich and Dixon 2000). The Ikhil gas field and pipeline is an Inuvialuit Petroleum Corporation project that began operating in 1999 to provide natural gas to the community of Inuvik. The reservoir is located in the Caribou Hills, about 50 km northwest of Inuvik (GNWT RWED 2002c).

Winter seismic programs have been common in this area for the last several years. During winter 2001 to 2002, several companies conducted 2-D and 3-D seismic survey programs on Richards Island, and also in the Mackenzie Delta and surrounding area, including the Beaufort Sea, and near Tuktoyaktuk, Aklavik and Inuvik. The companies involved include:

- Alberta Energy Company (now EnCana)
- Anadarko Petroleum Corporation
- Chevron Canada Resources
- Petro-Canada
- Shell Canada Limited
- Devon Canada Corporation
- ConocoPhillips

In addition to seismic activity, Devlan Exploration had two downhole test projects near Tsiigehtchic (Brackman 2002, personal communication).

Companies with 2002 to 2003 winter programs included Devon Canada, EnCana, ConocoPhillips, Petro-Canada and Imperial Oil Resources Limited. Oil and gas activities declined in winter 2003 compared to a busy year in 2002 (GNWT RWED 2003b). In total, three wells were drilled north of Inuvik by Petro-Canada, Devon Canada and Chevron (GNWT RWED 2003b).

In spring 2002, Devon Canada Corporation and partner Petro-Canada struck gas at their Tuk M-18 well. This was the first significant discovery in the delta in more than two decades (Northern News 2002a). Three other wells drilled with partners in the same region were unsuccessful. In April 2003, another significant gas discovery was made in the Mackenzie Delta. A partnership of Chevron Canada Resources, BP Canada Energy and Burlington Resources Canada found gas in commercial quantities at the North Langley K-30 well (Petroleum News 2003). The well was drilled by Akita Equitak Drilling, a joint venture of Akita Drilling and the Inuvialuit Drilling Corporation.

ConocoPhillips undertook 2-D seismic survey programs at the Parsons Lake field during summer 2000 and spring 2001, and a 3-D program during winter 2001 to 2002 (Brackman 2002, personal communication). In addition, Devon Canada Corporation conducted an on-ice program (Joint Secretariat 2003). Other

activities included the Japex Petroleum Exploration Company scientific research program, and exploratory wells by Petro-Canada and Devon Canada Corporation. The Inuvialuit Regional Corporation recently put some of its subsurface lands out for bids, resulting in two parcels being allocated to Chevron, and one each to Petro-Canada and Devon Canada Corporation (Brackman 2000). Devon Canada Corporation is also proposing an offshore exploration drilling program in the Beaufort Sea, north of Richards Island.

Table 6-1 lists the company names for the exploratory and significant discovery licences located within the 30-km-wide study corridor. Figure 6-2 shows current oil and gas dispositions within the ISR.

Table 6-1: Oil and Gas Dispositions Within the Study Area in the Inuvialuit Settlement Region

Company	Licence
Encana Corporation	EL 384
EnCana Corporation	EL 385
Burlington Resources	EL 393
Burlington Resources	EL 394
Petro-Canada	EL 406
Anadarko Canada Corp.	EL 407
Gyrfalcon Holdings Limited/Alberta Gas Marketing Inc.	PL 06
Chevron Canada	SDL 014
Chevron Canada	SDL 015
Chevron Canada	SDL 016
Shell Canada	SDL 018
Shell Canada	SDL 019
Suncor Energy Inc.	SDL 025
Suncor Energy Inc.	SDL 026
Gyrfalcon Holdings Ltd.	SDL 029
ConocoPhillips	SDL 030
Shell Canada	SDL 031
ConocoPhillips	SDL 032
Shell Canada	SDL 033
Shell Canada	SDL 035
Shell Canada	SDL 036
Imperial Oil Resources Limited	SDL 059
Imperial Oil Resources Limited	SDL 060
Imperial Oil Resources Limited	SDL 062
Imperial Oil Resources Limited	SDL 063

Table 6-1: Oil and Gas Dispositions Within the Study Area in the Inuvialuit Settlement Region
(cont'd)

Company	Licence
Imperial Oil Resources Limited	SDL 093
Shell Canada	SDL 100
NOTES: EL = exploratory licence PL = production licence SDL = significant discovery licence Includes all licences within the 30-km-wide study corridor	
SOURCE: INAC (2002a)	

6.3.6 Nontraditional Resource Harvesting

Commercial, domestic and sport hunting activities occur within the ISR but limited information is available for harvest numbers in the study area. According to the renewable resource officer in Inuvik (Ellsworth 2003, personal communication), resident hunters only sporadically use the project area that includes the three anchor fields and the gathering pipelines and associated facilities.

The following game management areas are within the ISR (GNWT RWED 2002c):

- Aklavik, Inuvik, Tuktoyaktuk, Paulatuk and Sachs Harbour Barren Ground Caribou Management Area I/BC/06
- Inuvik Grizzly Bear Management Area I/GB/03
- Aklavik, Inuvik, Paulatuk, Tuktoyaktuk Polar Bear Management Area I/PB/03

Three outfitters operate within the ISR (Northwest Territories Arctic Tourism 2003). Their activities include hunting for polar bear, barren-ground grizzly bear and barren-ground caribou.

Caribou is one of the more popular species hunted in the ISR. The lands from Inuvik to Swimming Point are important for caribou hunting, as both the Bluenose West and Cape Bathurst caribou herds pass through this area from November to January (Day 2002, personal communication). There are 500 commercial tags for Bluenose caribou allocated to communities in the ISR. The average annual harvest of the Bluenose West and Cape Bathurst herds comprises (Nagy et al. 1999):

- 1,934 subsistence kills
- 132 resident kills
- 30 nonresident kills
- 280 commercial kills

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Other game species include polar bear, grizzly bear and moose. Polar bear hunting is not common in the study area, and there is limited nontraditional moose hunting. Game hunting is permitted for black bear and small nonfurbearing mammals, i.e., hare, marmot, squirrel, porcupine.

Game bird hunting is permitted for ptarmigan and grouse (GNWT RWED 2002g). Hunting of migratory birds is regulated by the Canadian Wildlife Service, and requires a Migratory Game Bird Hunting Permit and a Habitat Conservation Stamp. Sport hunting is very popular around the East Channel of the Mackenzie River, Jimmy Lake and Sitidgi Lake (Community of Aklavik et al. 2000; Cournoyea 2002, personal communication; Day 2002, personal communication).

Within the Inuvik area, about 12 commercial fishing licences are issued annually to Gwich'in and Inuvialuit beneficiaries who distribute or sell fish to restaurants or individuals (Stephenson 2002, personal communication). The preferred species for consumption are broad whitefish and inconnu. Some northern pike and suckers are caught, but these are likely sold as dog food. Most commercial anglers have camps near Inuvik or make day trips from Inuvik. Four domestic fishing licences are issued in the ISR covering large geographic areas around Inuvik (Stephenson 2002, personal communication).

Sport fishers within the ISR must obtain a special validation from the GNWT RWED office. They must also register with either the local hunters' and trappers' committee or the Fisheries Joint Management Committee (FJMC) to cross Inuvialuit private lands (GNWT RWED 2002h). Common areas for sport fishing include Sitidgi, Noell, Husky and Jimmy lakes, which are accessible by snowmobile in winter and float plane in summer (Charlie 2002, personal communication; Clarkson 2002, personal communication; Cournoyea 2002, personal communication). The Yaya River and Yaya Lake are important fishing areas for northern pike, lake trout and inconnu (Day 2002, personal communication). The most popular sport fish species found in the Mackenzie Delta include inconnu, lake trout in the lakes and tundra rivers, and arctic char along the coast.

6.3.7 Tourism and Recreation

Licensed Inuvialuit guides and outfitters lead most land- and water-based tours within the ISR, and air charter companies operate air tours. About 16 tour operator companies are based in the Mackenzie Delta area and offer the following range of services (Northwest Territories Arctic Tourism 2003):

- air support to sport hunting lodges
- wildlife- and bird-watching tours
- river tours of the Mackenzie Delta and Beaufort Sea
- beluga whale tours
- fishing tours
- cultural tours of traditional camps and sites

Several operations offer guided ecotourism activities in the ISR, including chartered flights to Tuktoyaktuk and Herschel Island. Tourists can charter small aircraft, such as single-engine airplanes and helicopters, to view wildlife, especially whales. The main tourism companies offering flight tours include Beaudel Air, Aklak Air and Ookpik Tours (Cournoyea 2002, personal communication).

Currently, only a few operators conduct cultural immersion tours, e.g., tours of hunting camps, in the region. However, this activity is expected to increase (FJMC 2001). In addition, cruise ships travel to Tuktoyaktuk and Herschel Island, and tourists travel and camp along the Mackenzie and Dempster highways. Inuvik is the gateway to four national parks: Aulavik and Tuktot Nogait national parks in the Northwest Territories, and Vuntut and Ivvavik national parks in the Yukon.

Recreational boat traffic on the Mackenzie River, Mackenzie Delta and Beaufort Sea varies greatly, from icebreakers in the delta to luxury tours down the Mackenzie River (Great Canadian Rivers 2002). Local operators run small boat tours within the delta and estuary region, typically using zodiacs or kayaks, and primarily tour the Mackenzie River and coastal areas from Herschel Island to Tuktoyaktuk (Notzke 1995). Boat tour operators also use the Caribou Hills and Sandy Hills sites (Community of Aklavik et al. 2000; Cournoyea 2002, personal communication).

Sport fishing is offered as part of boat tours and bush camps, and ice fishing is offered in the winter. Tourists fish for northern pike and arctic grayling along Cabin and Caribou creeks (Stewart 1996). Peter Lake is also a popular winter and summer destination for outfitters fishing for lake trout.

The Kendall Island Bird Sanctuary currently has little to no tourism activity, although there are efforts to increase this through marketing and program development (Venaas 2003, personal communication). There are flight and activity restrictions in the Kendall Island Bird Sanctuary during June and July.

Other potential future tourism includes some activity near Reindeer Station and plans to develop activities at Sitidgi Lake. A tourism outfitting licence to visit Reindeer Station and nearby Peter Lake has been issued. There are two inactive lodges on Husky Lake, and there is no tourism development expected in this area (Venaas 2003, personal communication).

6.3.8 Other Commercial Activities

Additional commercial activities conducted in the ISR are:

- transporting goods for tourism and industry, by barge, road and air
- shipping supplies to communities
- herding reindeer
- selling game meat for consumption

Barging activities along the Mackenzie River run from mid-June through September. NTCL provides supplies to communities along the Mackenzie River (Great Canadian Rivers 2002). In August and early September, loaded barges are transported to NTCL's warehouse and distribution centre in Tuktoyaktuk, and from there supplies are shipped to coastal communities, including Sachs Harbour, Paulatuk and Holman, and also to oil and gas exploration sites (Marshall 2002, personal communication).

Fixed-wing and helicopter companies provide charter flights for government, industry, local residents and tourists. Travel is typically concentrated in summer. Winter flights are undertaken in support of oil and gas activities. Servicing and maintaining the communication towers at Tuktoyaktuk and Swimming Point, and conducting related activities on Garry and Pullen islands, are done using chartered aircraft (KAVIK-AXYS 2002).

The Kuññek Resource Development Corporation (KRDC), an Inuvialuit-owned company, owns and manages a reindeer herd in the ISR (KRDC 1999). The summer range of the herd is on Richards Island outside the Kendall Island Bird Sanctuary, and the winter range lies between Inuvik and Tuktoyaktuk. Spring and fall travel occurs between the mainland and Richards Island at Swimming Point when ice conditions allow. Commercial activities are currently limited to antler harvesting, but will eventually include meat production and tourism. The Kuññek Resource Development Corporation proposes to expand the current herd of 6,500 individuals to 10,000 to 12,000 reindeer by 2005. The reindeer will also be monitored and tagged to assist in managing of the herds and to prevent crossover with the Bluenose West and Cape Bathurst caribou herds (KRDC 1999).

6.3.9 Marine Operations

6.3.9.1 Shipping in Mackenzie Delta–Beaufort Sea

Summer shipping around Point Barrow, Alaska began in the late 1800s, when the whaling industry extended its activities into the Beaufort Sea area. Routine vessel movements into the Beaufort Sea area were largely dormant from when the whaling industry ceased hunting in this arctic area in the early 1900s until the distant early warning (DEW) line sites were put into place at various locations along the western arctic coastline in the late 1950s. Crowley Maritime used 277 tugs and 243 barges to transport almost 2.3 million tonnes of cargo to Alaskan DEW line sites from 1958 to 1983 and from 1968 to 1983. They also used 236 tugs and 257 barges to move 1 million tonnes of cargo to Prudhoe Bay (Tri Ocean Natchiq Engineering Ltd. 2003). NTCL has moved various vessels, barges and structures across the Point Barrow route.

Periods of relatively heavy ship traffic occurred in the Mackenzie Delta and Beaufort Sea during the early- to mid-1980s. At that time, hundreds of ships moved in and out of the project region, including barge traffic up and down the

Mackenzie River, and east and west along the Arctic coast. Substantial ship traffic was associated with drilling and other exploration activity within the Beaufort Sea. Many types of ships operated in these waters, including:

- conventional barges
- supply boats
- icebreakers
- tankers
- dredges
- crane barges
- drillships
- moored drilling platforms
- seismic and geophysical survey vessels
- floating dry docks
- small craft

Some of these vessels were ice-strengthened, so the shipping season could be extended to earlier in the spring and later in the fall.

In the last 15 years, shipping activity in the Mackenzie Delta and Beaufort Sea has been limited. Most of the shipping activity in the area is related to NTCL's supply and cargo shipping activity. NTCL supplies communities, logistics and staging locations, and North Warning System sites east of Tuktoyaktuk along the Arctic coast, across the Amundsen Gulf to Holman and Sachs Harbour, and occasionally to sites along the Arctic coast to the west, including northern Alaska. NTCL makes about 20 to 25 round trips per year from Hay River to Tuktoyaktuk. There has been little change in the annual pattern of shipping by NTCL since the mid-1980s, except for some increased traffic of 30 trips or more in the late 1990s related to winter drilling and exploration activity in the Mackenzie Delta (Jensen 2003, personal communication).

The Canadian Coast Guard conducts operations in the area, maintaining aids to navigation and serving as fixed or drifting marine research platforms. The Canadian Coast Guard generally sends one icebreaker per year from Victoria, British Columbia to the western basin of the Beaufort Sea. In 2003, the Canadian Coast Guard sent two research icebreakers from Quebec City and Halifax to conduct scientific research in the western basin (St. Jacques 2003, personal communication). More icebreaker activity could be initiated from the east coast, but no details are available (LaChapelle 2003, personal communication).

The Canadian Coast Guard has two vessels working in the Mackenzie River. The crews tend the navigational aids, keep range lines clear and occasionally go to Tuktoyaktuk (St. Jacques 2003, personal communication).

In the last three years, the Canadian Hydrographic Survey and Natural Resources Canada have conducted surveys of the areas around the artificial islands built in

the 1970s and early 1980s in the Beaufort Sea. The vessel used for the surveys makes two trips per year to Inuvik for re-supply and crew changes (St. Jacques 2003, personal communication).

Some foreign-flag ice-strengthened cruise ships and foreign-flag icebreakers acting as cruise ships pass through the region. The foreign-flag vessels generally cross the Beaufort Sea to or from the Northwest Passage. Marine Communications and Traffic Services reports that vessel traffic records are not maintained. Therefore, the exact number of foreign-flag vessels in the region is unknown (LaChapelle 2003, personal communication).

6.3.9.2 Dredging

Since the early 1970s, a substantial amount of dredging activity has occurred in the Beaufort Sea. At the peak of drilling and exploration activity in the Beaufort Sea in 1982, about 9.5 million m³ of material was dredged. This material was used for filling caisson-retained islands, building artificial islands and preparing set-down beds for bottom-founded structures. In addition, material was dredged from the shipping channels approaching Tuktoyaktuk from the northwest and southwest, and from the Tuktoyaktuk harbour. Figure 6-3 shows the locations of historical dredging activities in the Beaufort Sea between 1959 and 1982.

Dredging activity in the Beaufort Sea before 1970 and in recent years has been limited to harbours and some approaches. The volume of material dredged has varied from zero to 100,000 m³ per year.

Environment Canada's District Office in Yellowknife reports only one dredging project in the area that has been registered under the *Canadian Environmental Protection Act* (Government of Canada 1999) since 1982. In 1985 in Tuktoyaktuk Harbour, a cutter suction dredge removed 38,520 m³ of sediment to widen the channel to 40 m. Spoil was side-cast 10 m to the side of the channel (Dahl 2003, personal communications). GNWT Transportation confirmed that no dredging has been conducted in the river since 1995 (Shaw 2003, personal communication).

The Canadian Coast Guard reports that there has been no recent dredging in the reach of the Mackenzie River related to the project. Some dredging activity has been conducted around the mouth of the Hume River, just south of Fort Good Hope, and at the mouth of the Hay River (Maher 2003, personal communication).

Figure 6.3 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

Since 1982, considerable sedimentation and infilling of the Mackenzie River channel has occurred. Despite a lack of dredging in recent years, there is generally no impediment to the movement of conventional river traffic. The deepest draft vessels travel with reduced loads to prevent bottoming out. Supply barges carrying partial loads sometimes bottom out in places, but are able to change course slightly and continue through the channel. Unconventional ships on the river could experience more problems than conventional vessels (Shaw 2003, personal communication).

6.3.10 Environmentally Protected Areas

Community Conservation Plans (CCPs) for the Tuktoyaktuk, Aklavik and Inuvik areas have been developed within the ISR. The CCPs offer guidelines for development that reflect the views of hunters, trappers and anglers in the communities. The guidelines are designed to ensure conservation of renewable resources (Community of Aklavik et al. 2000, Community of Inuvik et al. 2000, Community of Tuktoyaktuk et al. 2000).

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 designations within the project area include:

- Category B – lands where cultural or renewable resources are of some significance
- Category C – lands of particular significance during specific times of the year
- Category D – lands of particular significance throughout the year
- Category E – lands of extreme significance and sensitivity

There are no Category A lands within the study area. Table 6-2 lists the CCP areas found in the portion of the study area within the ISR. Figure 6-4 shows the various categories of land found in the project area.

Table 6-2: Community Conservation Plan Areas Overlapping the Study Area within the Inuvialuit Settlement Region

Site No.	Area	Importance to Community
302C	Spring caribou harvesting areas	<ul style="list-style-type: none"> key harvesting area for caribou in the spring
303B	Spring moose harvesting areas	<ul style="list-style-type: none"> subsistence hunting of moose
304C	Spring goose harvesting areas	<ul style="list-style-type: none"> subsistence hunting of geese in the spring
305C	Spring fishing areas	<ul style="list-style-type: none"> subsistence fishing in the spring
307C	Summer fishing areas	<ul style="list-style-type: none"> subsistence fishing in the summer
310C	Fall fishing areas	<ul style="list-style-type: none"> subsistence fishing in the fall
312C	Fall goose harvesting area	<ul style="list-style-type: none"> subsistence harvesting of geese in the fall
314C	Winter wolverine harvesting areas	<ul style="list-style-type: none"> subsistence harvesting of wolverine in the winter
315C	Winter caribou harvesting areas	<ul style="list-style-type: none"> subsistence harvesting of caribou in the winter
316C	Winter fishing areas	<ul style="list-style-type: none"> subsistence fishing in the winter
322C	Critical grizzly bear denning areas	<ul style="list-style-type: none"> important from October to May for grizzly bear denning
323C	Mainland coastal polar bear denning areas	<ul style="list-style-type: none"> important from October to May for polar bear denning
701B	Bluenose west caribou herd winter range	<ul style="list-style-type: none"> important winter habitat for the Bluenose West caribou herd that is valued for subsistence harvest all year Fish and Husky lakes are also important for fishing resources
702B	Caribou Hills	<ul style="list-style-type: none"> has a unique succession of plant life. The middle Mackenzie Delta is a unique transition zone between alluvial taiga and low tundra habitats. important subsistence berry-picking area, and used for subsistence harvesting
704C	Fish Lakes and Fish River	<ul style="list-style-type: none"> important fish habitat, and important historic and current subsistence harvest area for the people of Inuvik and Tuktoyaktuk
706D	Kendall Island Bird Sanctuary	<ul style="list-style-type: none"> bird breeding season from May to August wetland habitat is sensitive all year important staging grounds for several shorebird and geese species from late August to late September
715C	Mackenzie Delta key migratory bird habitat	<ul style="list-style-type: none"> important nesting and breeding habitat for birds (May to September) important denning areas for grizzly bears (October to May) surrounding waters are important beluga habitat (June to September) important polar bear denning area (November to April) important past and current subsistence harvesting area, especially for beluga whales (June 15 to August 15) and waterfowl (June to September)

Table 6-2: Community Conservation Plan Areas Overlapping the Study Area within the Inuvialuit Settlement Region (cont'd)

Site No.	Area	Importance to Community
718D	Central Mackenzie Estuary	<ul style="list-style-type: none"> • concentration area for beluga • transit area between Shallow and Kugmallit bays • used extensively by feeding whitefish and inconnu • overwintering and nursery areas for a variety of fish
714CDE	Kugmallit Bay	<ul style="list-style-type: none"> • important past and current whale subsistence harvesting area from June 15 to August 15 • Management Category C is the eastern portion of Kugmallit Bay along the coastline and coastal waters, east to Warren Point • Management Category D extends from Pullen Island in the north, southward through parts of Richards Island, surrounding Beluga Management Zone 1A with a buffer zone in Mackenzie Bay • Management Category E is Beluga Management Zone 1A, situated in Mackenzie Bay
716CE	Mackenzie Bay and Shallow Bay	<ul style="list-style-type: none"> • important area for beluga whales and various waterfowl species • important past and present subsistence harvesting for the Inuvialuit • important traditional fishing area • Management Category C represents all the site, except Beluga Management Zone 1A in Mackenzie Bay • Management Category E is designated Beluga Management Zone 1A

Figure 6.4 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

The Kendall Island Bird Sanctuary (CCP 706D) encompasses 623 km² of the delta (Environment Canada 2000a, 2000b), providing important habitat for waterfowl and shorebirds (Environment Canada 2000c). The Canadian Wildlife Service manages this site, in cooperation with local communities and regional Aboriginal organizations, under the *Migratory Birds Convention Act* (Northwest Territories Protected Areas Strategy Advisory Committee 1999). A management agreement is under negotiation with exploration and development companies that have interests in the sanctuary (Northwest Territories Protected Areas Strategy Secretariat 2002). As stipulated in the *Inuvialuit Final Agreement*, beneficiaries may access the sanctuary, and hunt and trap wildlife within it (Environment Canada 2000d). Other types of land use in the Kendall Island Bird Sanctuary are subject to approval, require a sanctuary permit and are only permitted if they are of limited impact. There are air traffic activity restrictions in the Kendall Island Bird Sanctuary during June and July. Activity restrictions could relate to any development activity that could cause noise and disturbance to the birds, nesting and habitat, e.g., seismic exploration or other oil and gas activities.

In addition, the Canadian Wildlife Service identified a list of key migratory bird habitat sites throughout the ISR. The Mackenzie Delta is one of these sites and has been recognized by both the Canadian Wildlife Service and the CCP (Land Management Category D) as critical migratory bird habitat for nesting, staging and moulting waterfowl (McCormick et al. 1984, Inuvialuit Regional Corporation 2000). The low-lying habitat of this area encompasses 1,037 km², including the islands of the outer delta, Kendall Island, Pelly Island and part of Richards Island.

The proposed Niglintgak processing facility might be towed through Kugmallit and Kittigazuit bays to the Mackenzie River, passing through CCP Area 714CDE. The Category E portion of this area encompasses a beluga harvesting area (see Figure 6-4, shown previously). The beluga harvesting area in Kittigazuit Bay is a Beluga Management Zone 1A and is considered a protected area according to the guidelines described in the Inuvialuit Renewable Resource Conservation and Management Plan (Wildlife Management Advisory Council (NWT) and FJMC 1988). Figure 6-5 shows the location of the beluga management zones in the Beaufort Sea, east of Tuktoyaktuk.

Figure 6.5 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

The *Beluga Management Plan* guidelines for industrial activity in Zone 1A are as follows (FJMC 2001):

- *the oil and gas industry should not be permitted to explore for resources within or on the shores of any Zone 1 waters, nor to produce hydrocarbons or construct/operate any type of facility*
- *no mining activities, e.g., gravel removal, should be permitted within or on the shores of any Zone 1A waters*
- *development activities, such as hydroelectric or mining projects, even if located outside of Zone 1, should be evaluated for their potential deleterious effects on water quality and quantity, or on the salinity and integrity of ice in Zone 1 waters*
- *all shipping activities (including dredging) should be confined to designated routes and areas; passage through or close to Zone 1A outside of designated routes, even if the shortest route, should be avoided from breakup to August 15 (Figure 6-6 shows the designated shipping route through Kugmallit and Kittigazuit bays)*
- *no port development should be allowed within or on the shores of any Zone 1A waters*
- *commercial fishing proposals for Zone 1 should be evaluated and regulated with regard to beluga food species*

Beluga Management Zone 2 includes the Mackenzie Shelf waters shallower than 20 m not already included in Zone 1. Industrial activities are permitted in Zone 2 if they do not adversely affect the conservation of beluga whales and their habitat.

As noted previously, the Kugmallit Bay area is designated as Category C–D–E by the hunters' and trappers' committees. With respect to industrial activity in Kugmallit Bay, the Tuktoyaktuk Community Conservation Plan makes the following recommendations (Community of Tuktoyaktuk et al. 2000):

- FJMC should designate a shipping channel through Kugmallit Bay to Tuktoyaktuk Harbour and, if necessary, through Zone 1A, as stipulated in the Beluga Management Plan
- GNWT RWED, along with the hunters' and trappers' committee, should regulate whale watching tours as stated in the Beluga Management Plan, through application of the Beluga Protection Regulations and the Hunters' and Trappers' Committee Bylaws

Figure 6.6 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

- INAC should ensure no oil and gas seismic or production activity is allowed in Zone 1A of Kugmallit Bay from breakup to August 15, as outlined in the Beluga Management Plan
- FJMC and INAC should ensure that industrial activities or other projects permitted in Zone 2 areas do not adversely affect the conservation of beluga and their habitat, as outlined in the Beluga Management Plan
- Wildlife Management Advisory Council (NWT), Canadian Wildlife Service and INAC should ensure that waterfowl and their habitat are protected from industrial activities and other projects in the area, from May 1 to September 30
- FJMC and INAC should ensure that seals, their habitat and food sources are protected from July to September during fish runs and migrations
- FJMC and INAC should ensure that no dredging equipment or other facilities are deployed in Kugmallit Bay before the end of the first week of August
- community members should abide by the Beaufort Sea Beluga Management Plan Tourism Guidelines within the ISR

The Beaufort Sea Integrated Management Planning Initiative Working Group is evaluating the Beaufort Sea Beluga Management Zone 1A area as a possible marine protected area (MPA), and is carrying out socio-economic, ecological and technical assessments. Fisheries and Oceans Canada and the FJMC, along with representatives from the Inuvialuit Regional Corporation, Inuvialuit Game Council, Canadian Association of Petroleum Producers and INAC, are leading this initiative (Northwest Territories Protected Areas Strategy Secretariat and INAC 2001).

MPAs offer some level of protection within their respective jurisdictions, although internationally the term may be defined quite differently from jurisdiction to jurisdiction. Under the *Oceans Act* (Government of Canada 1996), Fisheries and Oceans Canada has the authority to formally designate MPAs. All MPAs would share minimum protection standards prohibiting ocean dumping, dredging and the exploration for, or development of, nonrenewable resources (DFO and British Columbia Land Use Coordination Office 1998).

No MPAs have been formally designated in Canada, and the process for creating MPAs is being developed with stakeholders. The steps to establish a new MPA include:

- identifying MPA candidates
- assessing MPA candidates
- recommending MPA designations

- making decisions for MPAs
- preparing management plans for MPAs

Evaluating the Beaufort Sea Beluga Management Zone 1A areas as a possible MPA is currently in the assessment phase.

Interim management guidelines might be applied to MPA candidates under exceptional circumstances when the guidelines are necessary to protect specific threatened marine resources until planning is completed. In an emergency, an MPA can be declared immediately under Section 36 of the *Oceans Act* for a maximum, but renewable, period of 90 days.

6.3.11 Visual and Aesthetic Resources

The Niglintgak area has no all-weather roads, but there is evidence of past winter roads, e.g., seismic lines, old well pads and gravel stockpiles. The area is mostly floodplain with patterned ground, dwarf shrubs, large quantities of water and beech ridges throughout the anchor field.

The Taglu area has a telecommunications tower and all-weather gravel roads connecting some of the old well pads. Some evidence of winter roads, e.g., green lines through the tundra, occur, and also of old well pads and gravel stockpiles left behind from past activity. Vegetation is similar to that of Niglintgak, but there are no beach ridges. There are pingos on the eastern side of the anchor field area.

Parsons Lake is an upland area with dwarf shrubs, upland plant communities and a large number of waterbodies. It is adjacent to the North Storm Hills, which reach elevations of up to 250 m. The terrain is hilly. There is evidence of an old camp on the lakeshore, old pad sites, seismic lines and an old winter road.

The northernmost portion of the gathering system is in the Mackenzie Delta floodplain. This area is low and subject to annual flooding. Vegetation is low, with some shrubs on drained sites. The terrain is fairly flat.

Farther south, the mainland part of the gathering system is higher in elevation and not subject to annual flooding. Vegetation communities are more varied, and include upland varieties and shrubs. The Holmes Creek area and part of the outer Parsons Lake area are the only two forested regions in the study area. Holmes Creek has black spruce and shrub communities, whereas cottonwoods have been found at the edge of the Parsons Lake field.

Infrastructure sites, other than those at the anchor fields, will primarily be located in areas where there is existing development – some active areas, some partially reclaimed, including:

- Swimming Point – an industrial staging site for Petro-Canada, with a camp, an airstrip, a barge landing site and fuel storage
- Lucas Point – an industrial staging site with a barge landing site and an airstrip
- Tununuk Point, or Bar C – was an exploratory staging site that has been partially reclaimed. Remnants of a camp remain, and there is an airstrip and barge landing site.
- Farewell – an industrial staging site for Shell Canada with a camp, an airstrip, a barge landing site and fuel storage.

6.4 Baseline Conditions – Gwich'in Settlement Area

6.4.1 Land Ownership

Most of the lands traversed by the project in the GSA are either federal Crown lands, administered by INAC, or Gwich'in private lands, administered by the Gwich'in Land Administration. Lands within the Town of Inuvik are municipal lands administered by the town (The UMA Group 1996). Commissioner's lands also exist within the town boundary and extend beyond the town boundary, within a block land transfer administered by the territorial government. Figure 6-7 shows land ownership in the GSA. Existing barge landing sites and roads will be used in Inuvik. The barge landing sites are situated on lands zoned heavy industrial. Marine transportation facilities are permitted within these zones.

6.4.2 Granular Resources

Within the GSA, several borrow sites are located adjacent to the Dempster Highway, and there is an area of granular potential near Caribou Lake (Gwich'in Land Use Planning Board (GLUPB) 2002). Existing borrow sites regularly used by the Town of Inuvik include:

- the Kenaston Pit located at Campbell Lake
- a pit near the Inuvik airport
- a pit about 20 km southeast of Inuvik (EBA 1987)

The Gwich'in own granular resources found on Gwich'in lands with subsurface rights. On all other Gwich'in lands, i.e., surface rights only, and Crown lands, the granular resources are owned by INAC.

Figure 6.7 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

6.4.3 Timber Resources

From the ISR–GSA boundary south to the Travaillant River, the vegetation changes from tundra to transition forest. In the Transition Ecological Zone, the tree line starts with a mixture of black spruce, tamarack trees and dwarf shrubs. It then becomes a predominantly forested region from Travaillant River to the GSA–SSA boundary. The forests contain black and white spruce and white birch, with uplands and rocky ridge features.

No commercial timber harvesting currently occurs in the GSA, except for fuel wood harvesting by Gwich'in beneficiaries and some residents. Because of the limited amount of timber available in the GSA, it is unlikely that timber harvesting in the study area will be expanded in the future (Clarkson 2002, personal communication). The Inuvik portable sawmill (WoodMiser), and Tsiigehtchic and Fort McPherson sawmills process small amounts of wood (14 to 18 m³) for picnic tables and small projects (Lewis 2002, personal communication). These sawmills are used to meet local demands for small construction projects.

6.4.4 Mineral Resources

No mines or ore deposits of interest occur within the study area in the GSA (CS Lord et al. 2002). Several prospecting permits have recently been issued to Diamondx Resources Ltd. along the eastern edge of the GSA (INAC 2003b). This area has been identified as the Lena West prospecting area, which covers about 25,000 km² in the Anderson River watershed (Diamondx Resources Ltd. 2003). Diamondx Resources Ltd. has plans to conduct extensive diamond exploration in this area.

6.4.5 Oil and Gas Activities

Table 6-3 lists the company names for the exploratory and significant discovery licences located within the 30-km-wide study corridor. The pipeline corridor within the GSA crosses two oil and gas exploratory licences held by Devlan Exploration (Inukshuk Geomatics Inc. 2000; INAC 2002a). Devlan Exploration is planning to drill a well in the Tsiigehtchic area in 2003 (GNWT RWED 2002a). In addition, Hunt Oil Company might conduct a 2-D seismic program in this area. The potential for discovery of oil throughout the GSA is low. However, natural gas might be present (GLUPB 2002). Figure 6-8 shows all current oil and gas dispositions within the GSA.

Figure 6.8 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

Table 6-3: Oil and Gas Dispositions Within the Study Area in the Gwich'in Settlement Area

Company	Licence
Devlan Exploration	EL 373
Devlan Exploration	EL 413
NOTE: Includes all licences within the 30-km-wide study corridor	

6.4.6 Nontraditional Resource Harvesting

Game hunting is permitted within the GSA for:

- black bear
- moose
- barren-ground and woodland caribou
- wolf
- wolverine
- small nonfurbearing mammals, e.g., hare, marmot, woodchuck, groundhog

Game bird hunting is permitted for ptarmigan and grouse. Hunting migratory birds is regulated by the Canadian Wildlife Service and requires a Migratory Game Bird Hunting Permit and a Habitat Conservation Stamp. Residents or nontraditional users take 3% of the annual wildlife harvest in the GSA. According to the executive director of the Gwich'in Renewable Resources Board, the pipeline route does not cross any designated guide–outfitter areas in the GSA (Clarkson 2002, personal communication).

According to a representative of Fisheries and Oceans Canada in Inuvik, no commercial fishing licences are issued for the GSA part of the study area (Charlie 2002, personal communication). Fisheries and Oceans Canada has issued some domestic fishing licences to GSA residents. However, little, if any, domestic fishing occurs near the study area (Charlie 2002, personal communication).

Sport fishing in the GSA is licenced by the GNWT RWED, and is subject to the terms and conditions set out in the *Gwich'in Comprehensive Land Claim* (GNWT RWED 2002h). Sport anglers may only fish in waters within Crown lands, unless permission to fish on Gwich'in lands is given by the local Renewable Resource Council (DIAND 1992). They must also obtain permission from the local Renewable Resource Council or from the Gwich'in Land Administration to cross Gwich'in private lands. In spring and summer and, to a lesser degree during the winter, Inuvik residents sport fish in Point Lake and Sunny Lake, southwest of the study area (Clarkson 2002, personal communication). Sport fish species present in the GSA include (GNWT RWED 2002h):

- arctic grayling
- burbot

- inconnu
- lake trout
- northern pike
- walleye
- whitefish

6.4.7 Tourism and Recreation

Limited opportunities are available for recreational use in the GSA part of the study area. Many residents travel to Sunny and Point lakes to camp in the spring and summer. One cabin on Sunny Lake is used by an Inuvik resident. Nonresident use of waterways within the study area is incidental in the GSA (Clarkson 2002, personal communication). The study area traverses the old Canadian National Telegraph line and some recreational activities, such as snowmobiling, occur along the Canadian National Telegraph line (Clarkson 2002, personal communication).

6.4.8 Other Commercial Activities

Other commercial activities within the GSA are limited. Transportation activities occur on the Mackenzie River and Dempster Highway. The Dempster Highway provides a transportation corridor for trucks almost all year. The Mackenzie River is an important transportation corridor for barges and other boats delivering goods to many of the communities along its banks, on the Beaufort Sea and in other parts of the Arctic. Barging activities occur along the Mackenzie River from mid-June through mid-October.

6.4.9 Environmentally Protected Areas

The GLUPB Land Use Plan identifies:

- special management zones, in which developments must protect valued resources identified by communities
- conservation zones, in which industrial activities are usually not permitted (GLUPB 2002)

The final federal approval for the Gwich'in Land Use Plan was received in August 2003, officially putting the plan into effect. Figure 6-9 shows the special management areas within the GSA.

Figure 6.9 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

Gwich'in Territorial Park is about 20 km from the pipeline corridor, south of Inuvik, on the east and south shores of Campbell Lake, immediately west of the Dempster Highway (GLUPB 2002). The park encompasses about 8,800 ha, and is classified as an Outdoor Recreation Park with two existing wayside parks and one existing campground.

The study area traverses four proposed special management zones (GLUPB 2002):

- Campbell Creek Special Management Zone
- Campbell Hills Special Management Zone
- Lakes Around Travaillant Lake Special Management Zone
- Mackenzie River Special Management Zone

The goal is to protect important fish and heritage resources by applying certain conditions. During peak fish migration periods in the spring and fall, no new activities requiring permits, licences or authorizations are allowed in these areas, unless it can be demonstrated that no negative impact on the fish will occur.

The pipeline route traverses the proposed Travaillant Lake, Mackenzie/Tree River Conservation Zone in the GSA. The local communities strongly support preserving this proposed zone because of the presence of cultural and environmental values, and the zone's critical importance to the people of Tsiigehtchic (GLUPB 2002). Currently, no development activity, including oil and gas development, is permitted within this zone. However, the GLUPB has acknowledged that the pipeline has potential use for this area and, with proper planning, the potential negative environmental and cultural impacts can be managed. A pipeline corridor through this zone would be considered only if:

- no feasible alternative to the corridor exists
- the shortest route possible is followed
- the most sensitive ecological and cultural areas are avoided
- no additional developments, e.g., borrow sites, access roads, camps, are proposed
- consultation with the Gwich'in communities and other affected parties takes place

The proposed pipeline corridor passes near the Nagwicheonjik National Historic Site administered by the Gwich'in Tribal Council. The Nagwicheonjik National Historic Site is a 175-km-long stretch of the Mackenzie River from 1 km upstream of the Thunder River confluence down to Point Separation and extending 5 km inland. Nagwicheonjik holds a prominent position within the

Gwichya Gwich'in cultural landscape, and is of great cultural, social and spiritual importance.

The Campbell Lake area was considered for designation as an International Biological Program site because:

- it is important as habitat for rare plants
- it is an endangered species nesting site
- it was an area of interest as a possible national wildlife area

Most of this area is now encompassed within the Campbell Hills Special Management Zone and Gwich'in Territorial Park.

6.4.10 Visual and Aesthetic Resources

From the GSA–ISR boundary, the landscape slowly changes from tundra to become more forested. In the Transition Ecological Zone, the tree line starts with black spruce, tamarack and dwarf shrubs. It then becomes a predominantly forested region from Travaillant River to the GSA–SSA boundary. The forests contain black and white spruce and white birch, with uplands and rocky ridge features. There are also flats and rolling plains.

In some areas, the pipeline will follow an existing Canadian National Telegraph line. Infrastructure sites will often be located in areas with existing development. For example, the Campbell Lake site is currently used as an industry staging site.

6.5 Baseline Conditions – Sahtu Settlement Area

6.5.1 Land Ownership

Most of the lands traversed by the project in the SSA are either federal Crown lands, administered by INAC, or Sahtu private lands, administered by either the K'ahsho Got'ine District Land Corporation or the Tulita Land Corporation. Lands proposed for project components within the towns of Fort Good Hope, Norman Wells and Tulita are municipal lands, which could include Commissioner's lands, administered either by the town or by GNWT, Municipal and Community Affairs. Figure 6-10 shows land ownership in the SSA.

In Fort Good Hope, there are several infrastructure components, including a barge landing site, camp, storage site, two borrow sites and several roads, and also a segment of the pipeline. All of the new project components within the Fort Good Hope town boundary are located on lands designated as hinterland, and there are no restrictions on land uses within this zone. However, restrictions exist on placing new developments within 450 m of the town's solid waste and sewage disposal site, or within 60 m of the water reservoir.

Figure 6.10 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

In Norman Wells, several existing infrastructure sites and roads will be improved and used. New project components within the town boundary will include a camp, a storage site, fuel storage, two borrow sites, the Norman Wells facility and a pipeline segment. All of the proposed new components will be located on lands zoned as hinterland (UMA Engineering Ltd. 1993). Although these land uses are not automatically permitted in the Hinterland Zone, pipelines and facilities are permitted at the discretion of the council.

The only project components planned for Tulita will be a barge landing site and some roads. The barge landing site and most of the roads are currently in place and will be improved for the project. As site use is not changing, there should be no conflict with the zoning bylaws of Tulita.

6.5.2 Granular Resources

Several borrow sites and related operations are located within the SSA part of the study area, especially near Norman Wells. These are primarily local operations that provide granular resources to communities for maintaining roads and other infrastructure. Some of the existing sites also provide support to petroleum operations in the Norman Wells area. A large quarry is located about 3 km east of Norman Wells, above the town landfill site. According to the forest management officer for the Sahtu region, there is also an existing borrow site located between Norman Wells and Tulita at the Little Bear River (Rivard 2002, personal communication).

The Sahtu own granular resources found on Sahtu lands with subsurface rights. On all other Sahtu lands, i.e., surface rights only, and Crown lands, the granular resources are owned by INAC.

6.5.3 Timber Resources

Within the SSA, upland forests cover much of the southern part of the region and there are extensive forests in level, poorly drained areas. Tree species found in these forests include white spruce, black spruce, pine, birch and aspen.

There are no major timber harvesting operations in the SSA part of the study area. Former timber harvesting facilities were located at Little Chicago and Grandview, i.e., a sawmill located north of Fort Good Hope on the Mackenzie River. Neither operation has been active for several years (Clarkson 2002, personal communication; Rivard 2002, personal communication). Each community in the SSA has a small lumber mill, typically consisting of a gas-powered band saw, to process timber for local use (Rivard 2002, personal communication). Residents harvest fuel wood along the winter road throughout the SSA (Rivard 2002, personal communication).

6.5.4 Mineral Resources

No deposits of interest have been identified in the SSA part of the study area (CS Lord et al. 2002). Several mineral claims, held by Patrician Consolidated Gold Mines Ltd., are located within the study corridor at the southern boundary of the SSA (INAC 2003b). In addition, several prospecting permits were recently issued to Diamondex Resources Ltd. along the northern boundary of the boundary of the SSA with the GSA and ISR (INAC 2003b). This area has been identified as the Lena West prospecting area, which covers about 25,000 km² of the Anderson River watershed (Diamondex Resources Ltd. 2003). Diamondex Resources Ltd. has plans to conduct extensive diamond exploration in this area.

South of the Diamondex Resources Ltd. prospecting permit area, several prospecting permits were issued to DeBeers Exploration Inc. and an individual, Mathew Mason (INAC 2003b). The pipeline corridor lands have been rated as having low mineral potential (Sahtu Land Use and Planning Board (SLUPB) 2001a).

6.5.5 Oil and Gas Activities

The most prominent petroleum industry activity within the SSA part of the study area is the Norman Wells oil field, which is under the Norman Wells Production Area Agreement. Imperial Oil Resources Limited operates this site and the associated Enbridge pipeline. In addition, several oil and gas exploratory licences are located near Norman Wells, Tulita and Colville Lake (Inukshuk Geomatics 2000; SLUPB 2001b; INAC 2002a). Some exploratory licences are also held in the Colville Lake area.

Table 6-4 lists the company names for the exploratory and significant discovery licences located within the 30-km-wide study corridor. The pipeline corridor in the SSA crosses eight exploratory licences and the Norman Wells Production Area Agreement. Figure 6-8, shown previously, depicts current oil and gas dispositions in the SSA.

Table 6-4: Oil and Gas Dispositions Within the Study Area in the Sahtu Settlement Area

Company	Licence No.
Canadian Abraxas	EL 389
Northrock Resources Ltd.	EL 391
EnCana Corporation	EL 392
EnCana Corporation	EL 398
EOG Resources Canada	EL 401
Devon ARL Corporation	EL 402
Canadian Forest Oil Limited	EL 412
Devlan Exploration Inc.	EL 413
Imperial Oil Resources Limited	PAA
NOTES: EL = exploratory licence PAA = production area agreement SDL = significant discovery licence Includes all licences within the 30-km-wide study corridor	
SOURCE: SLUPB (2001b), INAC (2002a)	

In winter 2001 to 2002, the only exploration activity in the SSA was the drilling of an unsuccessful well by EOG Resources Canada at Devo Creek, about 60 km northwest of Norman Wells (GNWT RWED 2002a). Activities conducted in winter 2002 to 2003 included Paramount Resources Ltd. and Canadian Natural Resources Limited drilling several exploration wells in the Colville Lake area (GNWT RWED 2002b, 2003b).

6.5.6 Nontraditional Resource Harvesting

Within the SSA, game hunting is permitted for:

- black bear
- moose
- caribou
- muskox
- wolf
- wolverine
- small nonfurbearing mammals, e.g., hare, marmot, woodchuck, groundhog

Game-bird hunting is permitted for ptarmigan and grouse. According to a wildlife technician for the Sahtu region, GNWT RWED recently established a limited-entry draw for muskox in the SSA, and lands for this hunt could potentially be accessed via the pipeline corridor (Popko 2002, personal communication).

Canadian Wildlife Service regulates hunting for migratory birds, and a Migratory Game Bird Hunting Permit and a Habitat Conservation Stamp are required.

No designated guide–outfitter areas exist within the study area part of the SSA. However, one outfitter – Jackson’s Arctic Circle Tours – operates out of Fort Good Hope at Manual Lake. There are eight big-game outfitting areas in the Mackenzie Mountains, seven of which are located either partially or entirely in the SSA. Most of these outfitters do some of their staging out of Norman Wells (Popko 2002, personal communication).

In the early to late 1990s, parts of the Bluenose West caribou herd overwintered in the Fort Good Hope area. Residents used the winter road to access the herd and some harvesting occurred within the study area. The herd has not been in this area for several winters, although the potential exists for them to return. Woodland caribou have been harvested along the winter road in the past. However, the Woodland caribou has recently been declared a threatened species (Committee on the Status of Endangered Wildlife in Canada (COSEWIC) 2002).

Only one commercial fishing licence has been issued near the study area – on Lennie Lake, located on the east side of the Norman Range (Popko 2002, personal communication). About 12 domestic fishing licences have been issued to residents of Norman Wells. Some of this fishing occurs in the Mackenzie River within the study area (Popko 2002, personal communication).

Sport fishing occurs in many lakes and streams in the SSA, and is licenced by the GNWT RWED (GNWT RWED 2002h). Sport fishing is subject to the terms and conditions set out in the Sahtu Comprehensive Land Claim. Sport anglers may fish only in waters on Crown lands, unless permission to fish on Sahtu private lands is given by a Sahtu Renewable Resource Council (DIAND 1993). Permission must also be obtained from the local Renewable Resource Council or land corporation to travel across Sahtu private lands. Sport fishing in the SSA is usually incidental and limited to the summer, except for Trout Lake. Trout Lake, near Bear Rock at Tulita, is accessed by winter road and is commonly fished in winter and spring (Popko 2002, personal communication). Sport fish species present in the SSA include (GNWT RWED 2002h):

- arctic grayling
- burbot
- bull trout
- inconnu
- lake trout
- northern pike
- walleye
- whitefish

Details regarding catch limits are found in the annual *Northwest Territories Sport Fishing Guide* (GNWT RWED 2002h).

6.5.7 Tourism and Recreation

Residents use a variety of waterways in the SSA for recreation. For example, residents, and to a lesser extent nonresidents, travel the Mackenzie River by boat for recreation. The Great Bear River is a popular canoeing destination in the summer, mostly for residents (Popko 2002, personal communication).

Tourism activities in the SSA include:

- the *SS Norweta* tour boat, which travels up and down the Mackenzie River all summer, stopping at most communities for photo opportunities, shopping and supplies
- jet-boat tours on the Mackenzie River and its tributaries
- tourism opportunities on Kelly Lake during the summer
- a tourist camp on Manual Lake that primarily operates in the summer (Popko 2002, personal communication)

Residents use the winter road and, to a lesser extent, the Enbridge right-of-way, for recreation during all seasons. In Norman Wells, other outdoor recreational users include members of a local birders' club, cross-country skiers, hikers and mountain bikers (Popko 2002, personal communication). The Canol Road and TransCanada hiking trails are accessible from Norman Wells.

6.5.8 Other Commercial Activities

In winter, the Mackenzie Valley Highway is extended via a winter road from Wrigley to Fort Good Hope. It is a transportation corridor for trucks carrying goods to the valley communities. The winter road is normally open from December until March, depending on weather conditions and commercial requirements for the road.

The Mackenzie River is an important transportation corridor for barges and other boats delivering goods to many of the communities along its banks, on the Beaufort Sea and in other parts of the Arctic. Barging activities along the Mackenzie River occur from mid-June through September.

6.5.9 Environmentally Protected Areas

The Draft Sahtu Land Use Plan, released in January 2003, identifies several special management areas and conservation areas (SLUPB 2003). The proposed pipeline route crosses four special management areas in the SSA:

- Yeltea and Manual lakes
- Colville Lake Trail

- Lac à Jacques, Turton Lake and Sam Macrae Lake
- the Mackenzie River

The right-of-way also traverses two conservation areas in the SSA:

- Fort Anderson Trail
- Great Bear River

Figure 6-11 shows the location of these areas.

The Sahtu Land Use Plan specifies that oil and gas exploration and development are acceptable activities within special management areas but are restricted or unacceptable within conservation areas. Applications can be made for amendments or exceptions, as long as amendment procedures and conditions are followed.

McKinnon Territorial Park is located in Norman Wells, on the banks of the Mackenzie River (GNWT RWED 2002f). This park is open from May 15 to September 15, and has eight nonserviced campsites, day-use and picnic facilities, and toilets. Although camping is permitted, Norman Wells residents use this park as a day-use area.

The Willow Lake and River area, also referred to as Bracket Lake, is just north of the Great Bear River, within the pipeline corridor. This area was considered for designation as an International Biological Program site as it contains many good examples of bog and pond successions (Dome et al. 1982; Hardy Associates Ltd. 1980; SLUPB 2001c). The area was enlarged to include the potential highway and pipeline transportation corridor to monitor the natural recovery processes following human disturbance. Willow Lake is a seasonal home to Sahtu beneficiaries from Tulita.

6.5.10 Visual and Aesthetic Resources

The predominant visual feature of the SSA is the forests, which include black and white spruce, and white birch on uplands and rocky ridges. There are also rolling plains with trees, shrubs, bogs and fens. Farther south are upland forests and in more level areas, extensive forests that tend to be poorly drained. Bear Rock, north of Tulita, is a prominent feature.

Figure 6.11 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

Historic seismic cutlines are found throughout the SSA, and industrial activity is especially prominent around Norman Wells. From Norman Wells south to Alberta, the pipeline route will generally parallel the Enbridge right-of-way. The project will endeavour to use existing infrastructure sites, including:

- a proposed site at Little Chicago, which includes a historical barge landing site, airstrip and seasonal camp facility. A meteorological station is located at the site. Nearby areas are used for local hunting and fishing camps.
- the Fort Good Hope site, which is situated at a barge landing site heavily used by Fort Good Hope residents
- the Norman Wells site, which is within the town of Norman Wells, which already has a large industrial presence
- the site planned near Tulita, which is currently used as an industry staging site and seasonal camp facility. The Norman Wells to Tulita winter road passes through the site.
- the Little Smith Creek site, which will be located at an existing site along the Enbridge right-of-way. It is currently used for maintenance activities and has an airstrip.

6.6 Baseline Conditions – Deh Cho Region

6.6.1 Land Ownership

Most lands to be traversed by the project in the DCR are currently under the legal ownership of the federal government, and are administered by INAC. It is expected that under the ongoing Deh Cho Process, involving the Deh Cho First Nations and the federal government, ownership to some of these lands will eventually be transferred to the Deh Cho. However, such lands have not yet been identified. In the north DCR, near the Blackwater River, are several parcels of Sahtu private land (see Figure 6-12). The Tulita District Land Corporation administers these parcels.

Some project components will be located in Fort Simpson and Hay River on municipal lands administered by the towns. These components include existing barge landing sites and storage areas that will be upgraded for the project. As these components already exist, no zoning conflicts are expected.

In addition to municipal lands, Commissioner's lands, administered by the territorial government, could be located within the community boundaries.

Figure 6.12 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

6.6.2 Granular Resources

Several existing borrow sites are located along the Mackenzie Valley Highway between Wrigley and Fort Simpson. Most of these sites were used during highway construction and have since been abandoned. Except for these sites, no other known borrow sites are located within the DCR part of the study area.

As the DCR is currently primarily Crown land, most of the granular resources are owned by INAC. However, the current land ownership and subsurface rights to resources could change once the Deh Cho First Nations have negotiated and finalized their land claim settlement.

6.6.3 Timber Resources

Within the DCR, upland areas are forested with aspen, spruce, birch and pine. Poorly drained areas are also forested, and much of the northern half of the region has been burned within the past 20 years.

No major timber harvesting operations occur in the DCR part of the study area. Jean Marie River residents operate a small community lumber mill and log home operation. However, timber is currently harvested outside the pipeline corridor (Davidge 2002, personal communication; Kraft 2002, personal communication). There is also a sawmill at Checkpoint, but it is inactive (Moore 2002, personal communication). Residents harvest fuel wood throughout the DCR and use the highway for access (Davidge 2002, personal communication; Kraft 2002, personal communication).

6.6.4 Mineral Resources

Mineral showings for copper, iron and zinc have been identified north of Wrigley (CS Lord et al. 2002). A gold deposit (placer) has been reported near the River Between Two Mountains and a zinc deposit has been identified in the Ebbutt Hills area. The development stage of these showings has not been assigned. However, these deposits were identified in the 1960s and 1970s, and have yet to be further explored. Several mineral claims are held south of Fort Simpson within the pipeline corridor (INAC 2003b). An individual from Ontario holds five mineral claims within the pipeline corridor and several more within 50 km to the west. The primary minerals sought are unclear as no known mineral deposits exist in this area (Quevillon 2003, personal communication).

6.6.5 Oil and Gas Activities

Existing petroleum industry activity in the DCR part of the study area is limited to the Enbridge Norman Wells pipeline. Some exploration has taken place along the pipeline corridor near Wrigley and south of the Mackenzie River (GNWT Renewable Resources 1985). Figure 6-13 shows oil and gas dispositions for the

DCR. There is one significant discovery licence, held by BP Canada Energy Co., that lies close to the pipeline study corridor in the DCR (SDL 003). Other current activities in the DCR are located in the Fort Liard and Cameron Hills areas (INAC 2002b, 2002c). Fort Liard is within the socio-economic study area, but outside of the 30-km-wide study corridor. Cameron Hills is located outside the study area.

6.6.6 Nontraditional Resource Harvesting

Some hunting occurs within the DCR part of the project area, primarily along (Kraft 2002, personal communication):

- the Mackenzie River
- the Mackenzie Highway
- other highways, winter roads and access roads
- the Enbridge pipeline right-of-way
- seismic lines

Hunters travel by truck, all-terrain vehicle and boat. There are currently no access restrictions for resident hunters regarding traditional lands. However, it is likely that restrictions for resident hunters will be included in a settlement agreement between the Deh Cho First Nations and the Government of Canada.

Species for which hunting is permitted within the DCR include:

- black bear
- moose
- woodland caribou
- wolf
- wolverine
- small nonfurbearing mammals

Game-bird hunting is permitted for ptarmigan and grouse. Hunting of migratory birds is regulated by the Canadian Wildlife Service, and requires a Migratory Game Bird Hunting Permit and a Habitat Conservation Stamp.

The study area within the DCR has no designated guide–outfitter areas. Two Mackenzie Mountain outfitters have operations either entirely or partially within the DCR. At least one of these two outfitters is based in Fort Simpson (Davidge 2002, personal communication).

Figure 6.13 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

Most DCR residents using the lands within the study area for hunting or to access hunting areas live in Fort Simpson. In Wrigley, only about three residents hunt using these lands. The primary big game species hunted in this area are moose and woodland caribou, although some incidental wood bison hunting occurs. There is a bison control area within the pipeline corridor where hunters may harvest bison. A full description of the bison control area can be found in the *Northwest Territories Wildlife Act, Nuisance Bison Control Regulations R-070-92* (Davidge 2002, personal communication). The study area in the DCR is also used for small game and waterfowl hunting.

Commercial fishing occurs in Trout Lake, Kakisa Lake and Great Slave Lake (Kraft 2002, personal communication). None of these lakes is near the proposed pipeline corridor. Most domestic fishing occurs in the larger rivers, and little fishing occurs in the smaller watercourses throughout the study area. Trout Lake is the only waterbody with the potential for domestic fishing other than the Mackenzie River. However, Trout Lake is outside the study area (Davidge 2002, personal communication).

The GNWT RWED licences sport fishing in the DCR (GNWT RWED 2002h). No access restrictions currently exist for sport anglers. However, it is likely that restrictions on sport fishing will be included in a settlement agreement between the Deh Cho First Nations and the Government of Canada. Most sport fishing occurs along the road system near Fort Simpson, only a small part of which is within the study area (Davidge 2002, personal communication). Sport fish species present in the DCR include (GNWT RWED 2002h):

- arctic grayling
- burbot
- bull trout
- inconnu
- lake trout
- northern pike
- walleye
- whitefish

Details regarding catch limits are in the annual *Northwest Territories Sport Fishing Guide* (GNWT RWED 2002h).

One trapping licence is issued to a resident of Liidlii Kue. However, the trapping area is west of Wrigley, well away from the study area. It is likely that upon completion of the claims process, the Deh Cho First Nations will introduce trapping regulations similar to those applied in the GSA and SSA.

6.6.7 Tourism and Recreation

Within the DCR, several tourism-based businesses operate in the area that might be traversed by the pipeline corridor. Activities offered include:

- boat charters
- river cruises
- day-trip fishing charters for walleye and pike
- package vacations
- various tours of the DCR from Fort Simpson
- canoeing
- sightseeing
- bush camps
- road safaris
- tours of Wrigley community
- hiking
- mountain biking

Throughout the DCR, particularly in the Fort Simpson area, those pursuing recreational activities frequently use all-weather and winter road corridors for touring by snowmobile or all-terrain vehicle (Davidge 2002, personal communication).

6.6.8 Other Commercial Activities

In the DCR, some minor areas of forage crop production occur near Fort Simpson (Dome et al. 1982).

The Mackenzie Valley Highway, which passes through Fort Simpson and ends in Wrigley, is a permanent highway that allows transportation of goods by truck to Wrigley. During the winter, the Mackenzie Valley Highway is extended via a winter road from Wrigley to Fort Good Hope. It is a transportation corridor for trucks carrying goods to the valley communities. The winter road is normally open December to March, depending on weather conditions and commercial requirements for the road.

The Mackenzie River is an important transportation corridor for barges and other boats delivering goods to many of the towns along its banks, and communities on the Beaufort Sea and in other parts of the Arctic. Barging activities along the Mackenzie River occur from mid-June through September.

6.6.9 Environmentally Protected Areas

Several existing and proposed protected areas occur in the DCR part of the study area (see Figure 6-14). Ebbutt Hills, north of Fort Simpson on the east side of the Mackenzie River, was considered for designation as an International Biological Program site because the accumulated permafrost there has resulted in peat landforms considered exceptional for the Great Slave Lowlands (Hardy Associates Ltd. 1980).

The Edézhíe Candidate Protected Area in the DCR was withdrawn from development under the Northwest Territories Protected Areas Strategy process (Canadian Parks and Wilderness Society 2002) (see Figure 6-14). This area includes a large piece of land known as the Horne Plateau, and extends west to the Mackenzie River along the Willowlake River Valley. The *Guidelines for Interim Protection* (Canadian Parks and Wilderness Society 2003) stipulate that no new dispositions will be granted in the area, but that existing rights will be honoured. Under the *Territorial Lands Act*, an Order in Council respecting the *Withdrawal from disposal of certain lands in the Northwest Territories (Edézhíe (Horn Plateau), Northwest Territories)* states there is a 4-km-wide corridor, required for a future pipeline and the associated infrastructure, in the Willowlake River area. It is centred on an existing pipeline right-of-way (Department of Justice Canada 2004). The candidate area includes the Enbridge Norman Wells pipeline right-of-way and the Mackenzie Highway.

Edézhíe is an important First Nations cultural and spiritual gathering place. The land is ecologically important. Local residents often refer to it as a giant sponge because of its exceptional wetland values. There are provisions for a pipeline corridor at the western tip of Edézhíe.

Pehdzeh Ki Deh, located near Wrigley, is designated an area of interest by Northwest Territories Protected Areas Strategy for its lakes and watersheds, and its traditional use by Pehdzeh Ki First Nation people (Northwest Territories Protected Areas Strategy Secretariat 2002). This area is also important for protecting sacred sites of the Pehdzeh Ki First Nation (Benjamin 2003, personal communication).

Liard River Crossing Territorial Park is located on the east side of the Liard River, south of Fort Simpson, less than 5 km west of the pipeline corridor (GNWT RWED 2003b). This area provides overnight facilities for travellers arriving at the Liard River Crossing outside the ferry service operating hours. The park has four unserviced campsites, day-use and picnic facilities.

Figure 6.14 has been removed for the purposes of reducing file size and can be viewed as a graphic separately. This document can be accessed through the link in the Table of Contents reference web page.

Fort Simpson Park and Visitor Centre is located in Fort Simpson. Fort Simpson Territorial Park and Campground is located at the confluence of the Mackenzie and Liard rivers, and is surrounded by the Snye wetland ecosystem. Many species of migratory waterfowl are seen in this area during spring and fall (GNWT RWED 2002i).

As part of its land withdrawal process with INAC, the Deh Cho First Nation has established buffer areas, about 2 km wide, for future pipeline construction through lands that otherwise have been withdrawn because of environmental issues, cultural importance or traditional use.

6.6.10 Visual and Aesthetic Resources

Within the DCR, upland areas are forested with aspen, spruce, birch and pine. Poorly drained areas are also forested, and there are patterned fens near Fort Simpson. South of Trout River are upland plateau areas. Much of the northern half of the region has been burned within the past 20 years. This has changed the visual and aesthetic qualities of the area. Evidence of seismic activity is especially noticeable south of Fort Simpson. The Mackenzie River is a prominent terrain feature in this area. Most proposed infrastructure sites within the DCR will likely be located on previously disturbed sites.

6.7 Baseline Conditions – Northwestern Alberta

6.7.1 Land Ownership

Lands traversed by the project in northwestern Alberta are all provincial Crown lands, administered by Alberta Sustainable Resource Development (ASRD).

6.7.2 Granular Resources

There are no known borrow sites in the study area within northwestern Alberta (Lussier 2002, personal communication). ColtKBR (2002) did not identify any potential borrow sites within the study area in Alberta during summer 2002 fieldwork.

6.7.3 Timber Resources

All of the northwestern Alberta study area is within Forest Management Unit 20 (Alberta Environment 2000). There are no forest management agreements currently in place in this area (Alberta Energy 2002). Tolko Industries has a 25-year agreement to harvest conifers and Footner Forest Products has a 25-year agreement to harvest deciduous trees south of Bootis Hill, outside the project area (Gabourie 2002, personal communication).

6.7.4 Mineral Resources

No mines or areas of mineral exploration are located near the study area within northwestern Alberta (Alberta Energy 2002). There are currently no coal dispositions in this area (Boodle 2002, personal communication).

6.7.5 Oil and Gas Activities

Several existing oil and gas developments are located in the study area within Alberta (Alberta Energy 2002). Developments include seismic exploration, well sites and pipelines. The companies involved in these activities include Talisman Energy, Husky Oil Operations Ltd. and Archeon Energy Ltd. The project pipeline corridor deviates from the Enbridge Norman Wells pipeline north of the Alberta boundary. Just south of the Alberta boundary, the project terminates and will link to the proposed NGTL ancillary project. The Enbridge pipeline continues to its terminus at Zama City. Oil and gas dispositions within and near the study area in Alberta are not shown in Figure 6-13 (shown previously) as they are too numerous to map at this scale.

6.7.6 Nontraditional Resource Harvesting

Hunting in Alberta is regulated by ASRD. A licenced guide or a hunter host must accompany all nonresident hunters of big game, wolf or coyote. The study area is located within Wildlife Management Unit 539, where there are nine guide–outfitter licences issued (ASRD 2002a). It is unclear how much guided hunting occurs in or near the pipeline corridor, although all nine outfitters are authorized to hunt black bear or moose in this wildlife management unit (Brick 2002, personal communication).

The hunting season for white-tailed deer, mule deer, moose, spruce grouse, sharp-tailed grouse and ruffed grouse extends from early September to late November. The hunting season for black bear runs from early September to late November and from mid-April to early July. Duck, coot, common snipe, white-fronted goose, snow goose, Ross' goose and ptarmigan can be hunted from early September to mid-December.

No domestic or commercial fishing currently occurs in the northwestern Alberta part of the study area (Gabourie 2002, personal communication). Sport fishing in Alberta is licenced by ASRD (2002b). The study area is located within Fish Management Zone NB3, in which the fishing season in rivers and streams extends from June 1 to October 31. Bistcho Lake, located east of the pipeline corridor, is popular for sport fishing. Sport fishing on the Petitot River is mainly incidental because of difficult access (Gabourie 2002, personal communication).

Sport fish species found in the study area in northwestern Alberta include (Mitchell 2001):

- arctic grayling
- walleye
- burbot
- northern pike
- whitefish

Within northwestern Alberta, the pipeline corridor traverses Registered Fur Management Areas 99 and 224 (Alberta Energy 2002, ASRD 2001).

6.7.7 Tourism and Recreation

The remoteness of the area limits recreational activities within the northwestern Alberta part of the study area.

6.7.8 Other Commercial Activities

No other commercial activities have been identified or are likely to be present because of the remote nature of the project area in northwestern Alberta.

6.7.9 Environmentally Protected Areas

In Alberta, the study area lies within a Caribou Protection Area (ASRD 2002c) (see Figure 6-14, shown previously). The pipeline corridor does not traverse any other existing or proposed protected areas in Alberta (Alberta Environment 2001, Boyd PetroSearch Ltd. 2001).

6.7.10 Visual and Aesthetic Resources

From the air, forested areas criss-crossed with seismic lines characterize this region. There is a mix of upland and wet lowland areas, and thick forests.

6.8 Synopsis

6.8.1 Land Ownership

Most of lands traversed by the project are either federal Crown lands or settlement area private lands. In Alberta, the lands traversed by the study corridor are all provincial Crown lands. Some project components are also located on municipal lands in the towns of Inuvik, Fort Good Hope, Norman Wells, Tulita, Fort Simpson and Hay River. The lands within town boundaries could include Commissioner's lands administered by the territorial government. No zoning conflicts have been identified in these towns.

6.8.2 Granular Resources

Granular deposits identified within the study area range from construction-quality aggregate to materials unsuitable for use as fill (EBA Engineering and F.F. Slaney and Company Limited 1974, Pemcan Services 1972). ColtKBR (2002) identified about 110 preferred and secondary locations for potential borrow sites between Inuvik and northwestern Alberta. Most of the preferred locations are composed of good-quality gravel or sand deposits, or a mixture of sand and gravel. In addition, some of the identified sites contain shale, sandstone, limestone or combinations of these materials. Because of their remote locations, many of the granular resource deposits have not been developed. Several sites developed in past years are not currently in use. Local communities use the few sites that are in operation primarily for construction of roads, well pads and other facilities or infrastructure. Some potential borrow sites have been reserved for future use by residents and will likely not be made available to the project.

6.8.3 Timber Resources

Timber resources in the study area are limited as the anchor fields and gathering pipelines and associated facilities are north of the tree line, and the more southern parts of the project are located in the transition zone from tundra to forest. Most of the forested area within the pipeline corridor is characterized by pulpwood-sized timber and scrub forest. Common tree species include:

- white and black spruce
- white birch
- trembling aspen
- balsam poplar
- tamarack
- jack pine

Lack of access and the slow growth of trees in the Mackenzie Valley are primary limitations to forestry in the Northwest Territories. In addition, natural forest fires occur throughout the North, and can limit the available timber supply. Between 1992 and 1995, several extreme fires greatly reduced the volume of standing live timber in the SSA (Rivard 2002, personal communication). Many of the best timber sites are located on recent alluvial sites adjacent to the Mackenzie River or its tributaries. Some logging has taken place at isolated locations within the Mackenzie Valley, primarily to meet local demand for building materials and fuel wood (Clarkson 2002, personal communication; Davidge 2002, personal communication; Rivard 2002, personal communication).

6.8.4 Mineral Resources

There are no existing mines within the study area. The study area shows little potential for mineral exploration or development. However, some parts of the

study area within the DCR exhibit some mineral showings for copper, iron and zinc (CS Lord et al. 2002).

6.8.5 Oil and Gas Activities

Over the last two decades, oil and gas activities in the Northwest Territories have been focused in the Norman Wells and Fort Liard areas. There was a moratorium on exploration rights in the Mackenzie Valley from 1977 to 1994 (Brackman 2001), partly because of the Berger inquiry. However, licences issued before the moratorium led to several significant discoveries in the Mackenzie Valley. Exploration rights have been granted since the moratorium was lifted in 1994 (Brackman 2001). There is extensive oil and gas development in the study area within northwestern Alberta, including seismic exploration, well sites and pipelines.

6.8.6 Nontraditional Resource Harvesting

Nontraditional resource harvesting includes hunting and fishing by residents and can be categorized as domestic, sport or commercial activity. All nonresident hunters must hire an outfitter to hunt big game. Land claim agreements reserve trapping exclusively for beneficiaries of the land claims. Therefore, limited nontraditional trapping occurs in the study area.

Hunting licences in the Northwest Territories are based only on residency. Many residents regard their hunting as primarily domestic, meaning they harvest game as a food source, as do Aboriginal resource harvesters. Many residents also pursue hunting for recreation and are referred to as sport hunters. Hunting activities are primarily regulated by GNWT RWED, but are also subject to terms and conditions set out in the land claim agreements (GNWT RWED 2002g).

Resident hunters may hunt only on Crown lands unless granted permission to hunt on private lands (DIAND 1992). Permission required to cross, or hunt on, selected lands is normally obtained through the local hunters' and trappers' committee or renewable resource council. Resident hunters are also required to request permission before crossing private lands to reach hunting areas. Residents throughout the Mackenzie Valley use existing clearings within the study area, e.g., the winter road, cutlines and the Enbridge pipeline right-of-way, for access to resource harvesting areas.

No commercial fishing occurs within the study area, although some occurs within the settlement areas. Domestic licence holders harvest fish as a food source for themselves, their families and their dogs. The licences are issued through Fisheries and Oceans Canada, and are subject to the approval of the local hunters' and trappers' committee or renewable resource council that exists for each land claim. Sport fishing occurs throughout the Northwest Territories.

Several outfitters offer guided hunts and fishing trips to nonresidents within the study area.

6.8.7 Tourism and Recreation

Tourism and outdoor recreation in the Northwest Territories and northwestern Alberta usually occur outside the study area, although some of these activities could be affected by the project. Several guided ecotourism activities occur in the Northwest Territories, including chartered flights to Tuktoyaktuk and Herschel Island. In addition, cruise ships travel to Tuktoyaktuk and Herschel Island, and tourists travel and camp along the Mackenzie and Dempster highways.

Outdoor recreational activities conducted by residents and nonresidents include:

- sport hunting and fishing
- water-based activities on the Mackenzie River
- hiking
- camping
- biking
- all-terrain vehicle use
- cross-country skiing
- snowmobiling
- dog sled touring

Guided fishing tours have long been a mainstay of the Northwest Territories tourism industry (Hinch 1995). In 1994, 8,902 visitors went to the Northwest Territories to sport fish.

6.8.8 Other Commercial Activities

Other major commercial activities in the study area include transportation, herding reindeer and agriculture.

The Mackenzie River is an important transportation corridor for barges and other boats delivering goods to many of the towns along the river, and to communities on the Beaufort Sea and in other parts of the Arctic. During the summer, tourists and residents use the Mackenzie River and several of its tributaries. The heaviest use occurs near communities adjacent to the river and its larger tributaries. Use of other waterways within the study area is more incidental.

The Mackenzie Highway is an important transportation corridor for trucks carrying goods to the valley communities. From mid-January to mid-March, the highway is extended via a winter road from Wrigley to Fort Good Hope.

Kuññek Resource Development Corporation, an Inuvialuit-owned company, owns and manages a reindeer herd in the ISR (KRDC 1999). Commercial activities are

currently limited to antler harvesting, but will eventually include meat production and tourism. The Kuññek Resource Development Corporation proposes to expand the current herd of 6,500 reindeer to 10,000 wintering and 12,000 summering reindeer by 2005.

No commercial agriculture occurs between Inuvik and Norman Wells because of the harsh climate. The Liard River and upper Mackenzie River valleys are the only areas along the corridor with the potential for agriculture, because of the combination of soils and climate. Good soils might be found in other locations, but low temperatures and a short frost-free season present severe restrictions to agriculture.

6.8.9 Marine Operations (ISR Only)

Periods of relatively heavy shipping traffic occurred in the Mackenzie Delta and Beaufort Sea during the early to mid-1980s. During that time, hundreds of ships moved in and out of the project region, including barge traffic on the Mackenzie River and along the Arctic coast. In more recent years, shipping activity has been limited. Most of the shipping activity in the area is related to NTCL's supply and cargo shipping activity. NTCL makes about 20 to 25 round trips per year from Hay River to Tuktoyaktuk. The Canadian Coast Guard, Canadian Hydrographic Survey and Natural Resources Canada also conduct limited operations in the area.

Historically, a substantial amount of dredging activity has occurred in the Beaufort Sea. At the peak of drilling and exploration activity in the Beaufort Sea in 1982, about 9.3 million m³ of material was dredged. Dredging activity in the Beaufort Sea before 1970 and in recent years has been limited to harbours and some approaches, with the volume of material dredged varying from zero to less than 100,000 m³ per year. Since 1982, only one dredging project in the Mackenzie River has been registered under the *Canadian Environmental Protection Act* (Dahl 2003, personal communication).

6.8.10 Environmentally Protected Areas

Several designated or proposed areas where development is to be limited are located within the study area.

The entire Northwest Territories might be subject to protection for caribou under the special regulations of the *Territorial Lands Act*. These regulations are in place to prevent conflict between caribou and land use activities (Northwest Territories Protected Areas Strategy Advisory Committee 1999). Ranges of the Bluenose West caribou herd and local woodland caribou are found in the study area.

The Canadian Heritage Rivers System is currently studying the Mackenzie River and a nomination document is expected by 2005. The Heritage River System is a

co-operative program run by the federal, provincial and territorial governments (Northwest Territories Protected Areas Strategy Advisory Committee 1999).

6.8.11 Visual and Aesthetic Resources

The proposed project traverses a wide variety of landscapes, from barren tundra to boreal forest, through upland and lowland areas. The Mackenzie River is a prominent feature, and both residents and visitors use it for recreation, including wilderness viewing.

Although industrial development in the Northwest Territories is relatively limited, many linear disturbances exist within the study area, e.g., seismic lines, winter roads, permanent roads and the Enbridge pipeline. Infrastructure sites will likely be located on previously disturbed sites, particularly along the Mackenzie River.

