

ENVIRONMENTAL IMPACT STATEMENT  
for the  
MACKENZIE GAS PROJECT

Volume 4: Part B

**Socio-Economic Baseline**

**Tsiigehtchic  
Community Report**

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## 1 INTRODUCTION

### 1.1 Background and Purpose

The purpose of this report on Tsiigehtchic is to present the response to the Joint Review Panel (JRP) request for a community-specific organization of the environmental impact statement (EIS) socio-economic baseline data. For consistency and ease of use, the document is similar in structure to, and has been assembled largely on the basis of, the regional-level material contained in the existing Volume 4 of the EIS. This report (hereinafter referred to as Volume 4B) presents a community focus on a stand-alone basis with the intent of meeting the needs of, and facilitating review by, each community without substantial reference to other EIS documentation. A corresponding document, Volume 6C, has been prepared to present the effects assessment on a community-specific basis.

### 1.2 How to Use this Report

Typical socio-economic material is presented in this report as follows:

- Section 2 – People and the Economy
- Section 3 – Infrastructure and Community Services
- Section 4 – Individual, Family and Community Wellness
- Section 5 – Traditional Culture

This volume also contains the following discussions:

- Section 6 – Nontraditional Land and Resource Use
- Section 7 – Heritage Resources

In order to help the reader locate content that may be of particular interest and to allow linkages for a given topic between the baseline information in Volume 4B and the effects assessment in Volume 6C, as well as to the existing Volumes 4 and 6 of the EIS, the following concordance table provides cross-references for the topics in each volume (see Table 1-1). Note that although the titles of sections match those found in the existing EIS Volumes 4 and 6, the numbering has changed in Volume 6C to accommodate new sections.

**Table 1-1: Environmental Impact Statement Topic Areas**

<b>Topic</b>	<b>EIS, Volume 4</b>	<b>Volume 4B</b>	<b>EIS, Volumes 6A and 6B</b>	<b>Volume 6C</b>
Introduction	1.0	1.0	1.0	1.0
Geographic Area of Interest	–	–	–	2.0
Public Participation	–	–	–	3.0
Project Expenditures	–	–	2.0	–
National Economic Effects	–	–	3.2	–
Population Composition and Dynamics (Demography)	2.2.1, 2.3.1, 2.4.1, 2.5.1, 2.6.1, 2.7.1, 2.8.1, 2.9.1	2.2	3.3	4.2
Economic Activity	2.2.2, 2.3.2, 2.4.2, 2.5.2, 2.6.2, 2.7.2, 2.8.2, 2.9.2	2.3	3.1	4.1
Labour Force	2.2.3, 2.3.3, 2.4.3, 2.5.3, 2.6.3, 2.7.3, 2.8.3, 2.9.3	2.4		
Income Sources and Amounts	2.2.4, 2.3.4, 2.4.4, 2.5.4, 2.6.4, 2.7.4, 2.8.4, 2.9.4	2.5		
Cost of Living	2.2.5, 2.3.5, 2.4.5, 2.5.5, 2.6.5, 2.7.5, 2.8.5, 2.9.5	2.6		
Transportation Infrastructure	3.2.1, 3.3.1, 3.4.1, 3.5.1, 3.6.1, 3.7.1, 3.8.1, 3.9.1	3.3	4.1	5.2
Utilities, Energy and Communications	3.2.2, 3.3.2, 3.4.2, 3.5.2, 3.6.2, 3.7.2, 3.8.2, 3.9.2	3.4	4.2	5.3
Housing	3.2.3, 3.3.3, 3.4.3, 3.5.3, 3.6.3, 3.7.3, 3.8.3, 3.9.3	3.5	4.3	5.4
Recreation	3.2.3, 3.3.3, 3.4.3, 3.5.3, 3.6.3, 3.7.3, 3.8.3, 3.9.3		4.4	5.5
Governance	3.2.4, 3.3.4, 3.4.4, 3.5.4, 3.6.4, 3.7.4, 3.8.4, 3.9.4	3.2	4.5	5.1
Health Conditions	4.2.1, 4.3.1, 4.4.1, 4.5.1, 4.6.1, 4.7.1, 4.8.1, 4.9.1	4.2	5.3	6.2
Health Care Facilities and Services	4.2.2, 4.3.2, 4.4.2, 4.5.2, 4.6.2, 4.7.2, 4.8.2, 4.9.2	4.3	5.2	6.1

Table 1-1: Environmental Impact Statement Topic Areas (cont'd)

Topic	EIS, Volume 4	Volume 4B	EIS, Volumes 6A and 6B	Volume 6C
Family and Community Conditions (Community Well-Being)	4.2.3, 4.3.3, 4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3, 4.9.3	4.4		
Human Health Risks	–	–	5.4	6.3
Accidents and Malfunctions	–	–	–	6.4
Social and Protection Facilities and Services	4.2.4, 4.3.4, 4.4.4, 4.5.4, 4.6.4, 4.7.4, 4.8.4, 4.9.4	4.5	5.5	6.5
Education and Training	4.2.5, 4.3.5, 4.4.5, 4.5.5, 4.6.5, 4.7.5, 4.8.5, 4.9.5	4.6	5.6	6.6
Traditional Harvesting	5.2.1, 5.3.1, 5.4.1, 5.5.1, 5.6.1, 5.7.1, 5.8.1, 5.9.1	5.2	6.2	7.1
Trapping	5.2.2, 5.3.2, 5.4.2, 5.5.2, 5.6.2, 5.7.2, 5.8.2, 5.9.2	5.3		
Aboriginal Language	5.2.3, 5.3.3, 5.4.3, 5.5.3, 5.6.3, 5.7.3, 5.8.3, 5.9.3	5.4	6.3	7.2
Nontraditional Land and Resource Use	6.0	6.0	7.0	8.0
Heritage Resources	7.0	7.0	8.0	9.0
Cumulative Effects	–	–	9.0	–
Monitoring and Follow-Up	–	–	10.0	10.0
References, Glossary	end	end	end	end
NOTE: – = not included, or not discussed				

### 1.3 Study Area

The socio-economic study area includes all of the communities in the Northwest Territories in which the direct or indirect effects of gas production and pipeline construction may affect permanent residents.

The socio-economic study area also includes northwestern Alberta, where, in an ancillary project, NOVA Gas Transmission Ltd. (NGTL) is proposing to construct the Northwest Mainline (Dickins Lake and Vardie River Sections) and the NGTL interconnect facility.

Figure 1-1 illustrates the study area communities.

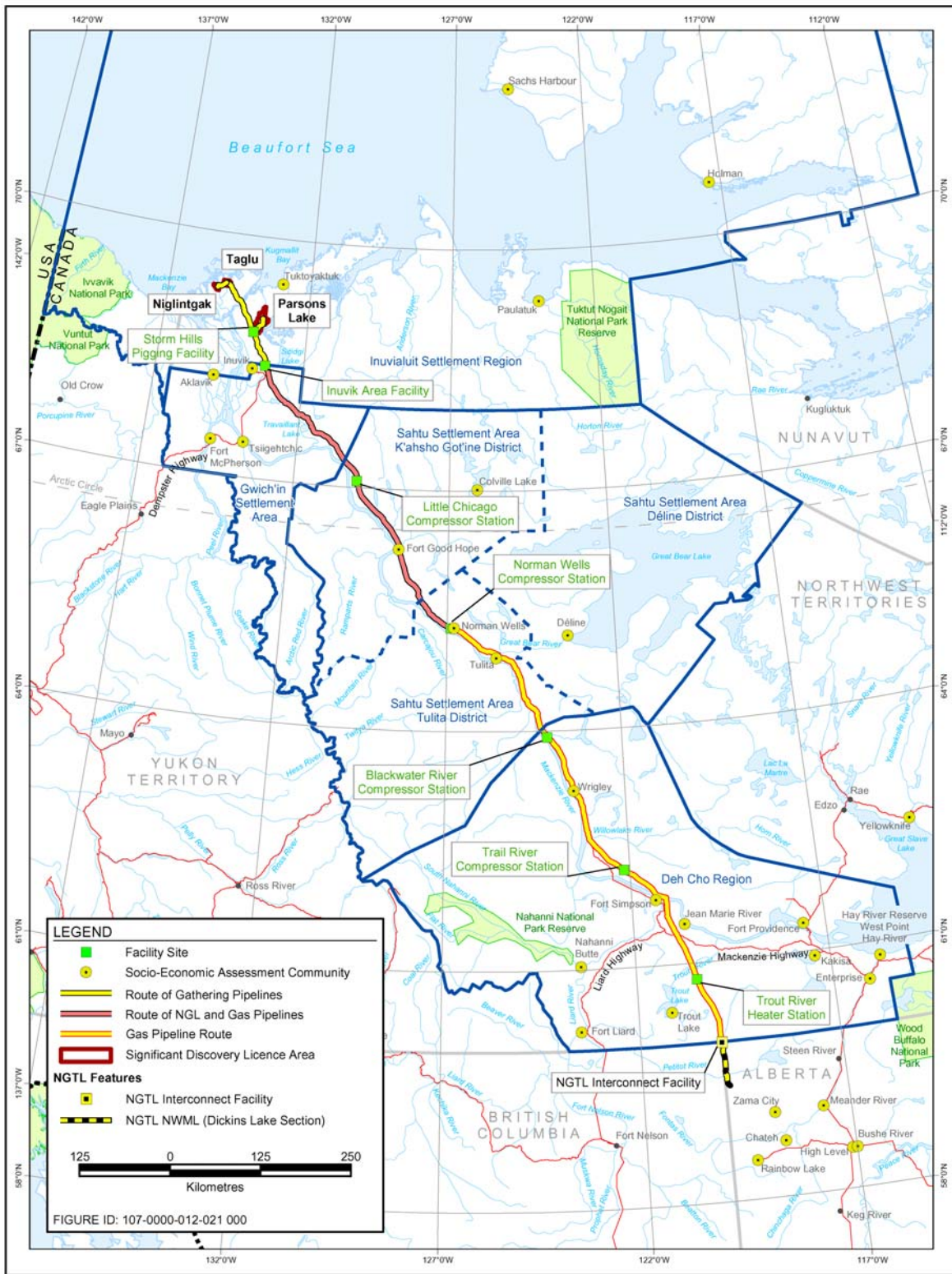


Figure 1-1: Study Area Communities

The nontraditional land and resource use, and heritage resources portions of the socio-economic impact assessment (SEIA) identify specific local study areas (LSAs) and regional study areas (RSAs) in relation to project component locations and activities.

#### **1.4 Summary of the Socio-Economic Baseline for Tsiigehtchic**

Tsiigehtchic, a breakaway community from Fort McPherson, is about 90% Aboriginal, with a population of about 200 persons. Tsiigehtchic, Inuvik and Fort McPherson are the three communities located in the Gwich'in Settlement Area (GSA). Tsiigehtchic is a charter community governed by a Chief and Council. Local services and community expenses are supported through funding received from Government of the Northwest Territories (GNWT), Municipal and Community Affairs (MACA), and Indian and Northern Affairs Canada (INAC).

The economy in Tsiigehtchic is predominantly traditional, with most residents harvesting game locally, and fish from the rivers and lakes. However, there are some monetary components in the economy focused on hydrocarbon-related resources. The potential labour supply is low at 32% of the population aged 15 years and older, and of those available, close to 82% commented that they required some training. The reliance on a traditional economy is considered to be a positive feature of the community because the cost of living in Tsiigehtchic is about 50% higher than in Edmonton.

Tsiigehtchic is accessible by an all-weather highway connection to the south, with seasonal restrictions during breakup and freezeup. Tsiigehtchic has no scheduled air service, nor does it have rail access or bus service.

Quality of housing in Tsiigehtchic is lower in comparison to most prairie province communities, with nearly 25% of the households needing major repairs. For recreational facilities, Tsiigehtchic has a community hall and community centre, playgrounds, and a school gym.

Tsiigehtchic has a health centre able to provide basic medical and social services required by the community. The Inuvik Regional Hospital is the closest major health care facility. Air ambulances stationed in Inuvik are able to provide a speedy response in the event of a medical emergency. Tsiigehtchic is policed by the Royal Canadian Mounted Police (RCMP) Fort McPherson detachment. Therefore, no alcohol offence-related rates specific to this community are available.

Tsiigehtchic provides kindergarten to Grade 12 schooling. However, the percentage of the adult population in 2001 that had graduated from high school is low, at 40%, with more men than women being high school graduates. The Aurora College community learning centre in Tsiigehtchic offers post-secondary education diploma and certificate programs and courses.

In 1998, 73% of the Tsiigehtchic residents reported that half or more of their diet was country food, and 58% of adults hunted or fished. About 31% of the Tsiigehtchic residents over the age of 14 years can speak an Aboriginal language.

## 1.5 Approach

This SEIA is designed to focus on how the project may affect the wellness of a community. Wellness is often the most highly valued aspect of community life, and depends on the well-being of individuals, families and the community as a whole. Community wellness may be significantly enhanced by project benefits, and be vulnerable to adverse effects.

The effects assessment is focused on addressing community concerns, with the aim of designing and implementing the project using procedures that optimize beneficial effects and reduce effects the communities believe to be undesirable.

A community-driven approach requires:

- knowledge about the characteristics of the communities that may be affected
- understanding of the interests and concerns of these communities

Knowledge of community characteristics has been obtained by collecting information from residents who are informed about a particular circumstance. Information on interests and concerns was gained in the meetings and community consultations held with residents of Tsiigehtchic and the other communities in the GSA.

### 1.5.1 Why the Baseline is Important

The baseline conditions provide the context for assessing the potential effects of the project. The data presented in this report allows an assessment of the capacity of the people, institutions, corporations and governments to respond to the project. Communities experience socio-economic effects in accordance with two primary interactions:

- physical, social or economic interaction between project component activities or personnel, and community residents and their economic, social or cultural resources and pursuits
- supplying workers or business services to the project, which generates income for firms and individuals. The spending or investment of this income will have both positive and negative effects.

## **1.6 Information Needed to Support the Effects Assessment**

### **1.6.1 Background**

The initial approach to collecting baseline information resulted in more than 440 tables of social and economic data with possible relevance to project effects.

To create a comprehensive yet readable document, the process of synthesizing and analyzing this tabular data to describe the baseline conditions succinctly, and eventually predict and monitor project effects included:

- presenting selected tables, some of which contain several indicators which are considered necessary to understand a particularly sensitive issue, such as:
  - alcohol abuse, which is captured by data on hospitalizations for alcohol-related illnesses, alcohol-offence data from the police and self reports of frequency of heavy drinking
  - traditional resource harvesting, which requires several indicators to understand its possibly changing significance
- providing some data-based conclusions without supporting tables

In this document, tabular information for Tsiigehtchic is bolded to make it stand out from the other, usually regional-based, presentations.

### **1.6.2 Specific Sources**

#### **1.6.2.1 People and the Economy**

Information in Section 2, People and the Economy includes:

- labour force activity:
  - participation
  - employment and unemployment rates
  - jobs currently held
- labour force education and training achievements

Also relevant is information on the sizes of various sectors of the economy, as they are possible sources for the goods and services that might be needed.

### 1.6.2.2 Infrastructure and Community Services

Section 3, Infrastructure and Community Services contains detailed, community-specific information on infrastructure facilities, including descriptions of:

- water supply
- disposal of liquid and solid waste
- power supply and fuels used
- air, land, rail and water transport arrangements and frequencies
- communication facilities and services
- housing conditions and recreation facilities

This section also includes a discussion of governance.

### 1.6.2.3 Individual, Family and Community Wellness

Section 4, Individual, Family and Community Wellness describes individual, family and community wellness. Much of the information relates to wellness aspects and influence, including:

- physical, mental and emotional health
- family relationships
- community behaviours

Most of the data on wellness is negative, e.g., rates of illness, family violence and crimes, rather than positive, i.e., healthfulness, family solidarity or good citizenship, because official data is not often collected or reported publicly on positive indicators.

This section describes the following influences that affect wellness:

- individual, e.g., substance abuse, and the problems it causes
- institutional, e.g., levels of problem conditions reported by protective and helping agencies, health and social service professionals, and police

Section 4 also provides information on agencies and programs, and relevant statistics related to those influences.

### 1.6.2.4 Traditional Culture

Section 5, Traditional Culture provides information on traditional culture, which includes the knowledge, skills, disciplines, beliefs and values of the Aboriginal people. Traditional culture is important to them because it is:

- their principal source of pride, worth, distinctiveness and identity

- the basis for harvesting the benefits and meeting the challenges of survival on the land they respect and love
- their primary defence against the prejudice and discrimination sometimes experienced from Euro-Canadians

Indicator data for beliefs and values is currently unavailable for Tsiigehtchic. Some data is now being collected through ongoing traditional knowledge studies.

Three cultural indicators, based on people's activities, are currently available for GSA and Tsiigehtchic:

- involvement in traditional harvesting
- the amount of country food consumed
- the ability to speak a traditional language

Traditional harvesting has an important physical and psychological influence on wellness in Aboriginal communities. Wild fish, game, plants and berries are nutritionally superior to processed food and are sources of natural medicine (Usher 1976). Furthermore, country foods are shared within a community, thereby enhancing community solidarity. Preserving traditional language has an important psychological influence on wellness by helping to establish feelings of identity and purpose.

#### **1.6.2.5 Nontraditional Land and Resource Use**

Section 6, Nontraditional Land and Resource Use describes existing land and resource uses for nontraditional users, including residents and nonresidents within the GSA. The focus is on the land or resource uses that the project could affect, including:

- granular resources
- timber resources
- mineral resources
- oil and gas activities
- nontraditional resource harvesting, including hunting and fishing
- tourism and recreation
- other commercial activities
- environmentally protected areas
- visual and aesthetic resources

In addition to discussions of these valued components, a description of land ownership in the GSA is also provided.

### 1.6.2.6 Heritage Resources

The objective of Section 7, Heritage Resources is to provide a synopsis of the prehistoric and historic culture of the GSA, to:

- determine the relative heritage resource potential of project component areas
- interpret and evaluate the heritage resources encountered during the 2002 and 2003 field work program
- formulate recommendations to manage project effects on heritage resources

### 1.6.3 Information Collection and Verification

Collecting data for this volume involved:

- collecting quantitative and qualitative data
- verifying the data during community consultations

Quantitative data was obtained from:

- 1996 and 2001 censuses of Canada
- special surveys conducted by the Government of Canada and GNWT
- GNWT Health and Social Services (HSS)
- RCMP administrative records

Relevant information was also obtained from literature reviews. In addition, government agencies were helpful in providing several special tabulations.

Government agencies and nongovernmental organizations (NGOs) provided details on staffing, resources, policies, training and other programs.

Qualitative data was obtained during interviews with community and territorial officials and other knowledgeable people during visits to all the study area communities that may be affected by the project. Many of these visits were to:

- collect baseline information
- review it with local knowledgeable people
- seek corrections, qualifications and valuable additional information

In the broader context of public participation in the EIS, two rounds of community meetings and regional workshops were held to:

- share project information
- gather community feedback on the project description
- identify and verify key issues and concerns
- identify potential effects and suitable mitigation measures

The meetings provided valuable qualitative information, based on local experience and insights.

To protect the identity of individuals, information obtained during interviews has usually been attributed to an organization, rather than citing an individual's name. In other cases, names and dates have been cited in the text and the information about the personal communication provided in the list of references.

For further information on the public participation process, see Volume 1, Section 4, Public Participation of the EIS.

## **1.7 Data Limitations**

To the extent possible, information contained in the EIS has been supplemented by data and information available at the community level. For Volume 4B, in order that regional and community presentations are internally consistent and comparable, only limited new data is presented. However, the report may include data previously collected, but not presented in Volume 4 of the EIS. Many of the communities in the Northwest Territories have relatively small populations, which means that data collected by Statistics Canada and other agencies, at the community level, is either suppressed or has limitations for reasons of maintaining confidentiality. This means that in several instances information and analysis is constrained to a regional level discussion.

### **1.7.1 Context for Understanding the Data**

In creating descriptions of baseline conditions, the analysts assessed and synthesized the qualitative and quantitative information collected. These descriptions are based on verified published data and reflect documented opinions of regional and local public service delivery personnel. However, the evaluation of socio-economic conditions is subjective. Both groups and individuals, whether trained social scientists or not, have valid but varied opinions on the importance of individual issues and what these might mean with regard to community wellness.

The socio-economic baseline conditions set the stage for predicting the specific aspects of a community that may change because of project influences, either those that may benefit from project effects, e.g., employment and income, or those that may be adversely affected, e.g., health and wellness conditions.

### 1.7.2 Data and Indicators

Accurate descriptions of existing baseline conditions, and the eventual monitoring of possible project effects, depend on quantitative and qualitative indicators, which are vulnerable to several types of distortion:

- quantitative, statistical data include administrative statistics, e.g., health care treatments, police, child welfare and suicide, and data from the census and special surveys. Administrative data may vary because of:
  - changes in policies, e.g., health care, police, child welfare policies
  - how individual practitioners interpret or implement policy
  - the care with which data is recorded
- census and other survey data is flawed by under-enumeration. Particular difficulties occur in census taking in the Northwest Territories because many people leave communities to hunt, fish or visit. Attempts to reach them by telephone and repeated visits to small, outlying communities can fail. The GNWT Bureau of Statistics conducts a special survey in every census year to estimate census under-enumeration.
- qualitative data refers to generalizations about past and current conditions, and expected trends obtained from knowledgeable community residents. These include service delivery personnel, i.e., health, police, education and social services, personnel, and residents of local communities. Each group may not have previously shared their information with the other groups.

### 1.7.3 Limitations of Low-Frequency Data

Statistics Canada randomly rounds frequency data to zero or five. When such rounded and imprecise frequencies are converted to percentages, the totals of these percentages sometimes do not sum to 100%. When the rounded low-frequency data for very small populations is converted to percentages, the total is commonly higher or lower than 100%, depending on the distortions caused by the rounding.

For most of the small communities, creating community-specific socio-economic indicators based on statistical tabulations might not produce reliable results. In these situations, the qualitative data collected in interviews with knowledgeable individuals is often critical in clarifying the significance of available data and making valid interpretations. This situation applies to Tsiigehtchic.

Any problems associated with interpreting data for small community populations can be avoided by aggregating the data for such communities when they share similar characteristics. For example, Sachs Harbour, Paulatuk, Tsiigehtchic and Holman have very small populations. As a result, public agencies sometimes pool

data for these communities, reporting data only for the combined Inuvialuit Settlement Region (ISR) and GSA, identified as the Beaufort Delta Region (BDR). Some GNWT administrative data is also only available in this form. In some of the ISR and GSA sections in this volume, BDR data is presented because region-specific data is not available. This aggregation is appropriate as all BDR communities share certain characteristics and are influenced by their dependence on Inuvik for certain resources.



## 2 PEOPLE AND THE ECONOMY

### 2.1 Introduction

This section describes the people who live in Tsiigehtchic, together with similar information for the other GSA communities to provide context. The information presented describes the populations of the GSA and their economies, including:

- population composition and dynamics
- economic activity
- labour force
- income sources and amounts
- cost of living

Generally, in comparison with the rest of Canada, the territorial population is relatively young, although both the birth and the death rates have been declining for the past 20 years.

Migration rates are also high in the Northwest Territories, primarily because about half the population is non-Aboriginal. Most of these people spend some years in the territories, and then return home to the southern provinces.

Compared to other areas of Canada, the territorial population is small and geographically scattered. The economy has both traditional and monetary components, with the monetary component increasingly dependent on extracting mineral and hydrocarbon-related resources. See Section 5, Traditional Culture for information on participation in the dual economy.

### 2.2 Population Composition and Dynamics

Communities in the GSA include Inuvik, the commercial and administrative hub of the Mackenzie Delta, and the two smaller, and largely Aboriginal communities of Fort McPherson and Tsiigehtchic.

Table 2-1 shows the 2003 estimated population of the GSA communities was 4,450, including 207 in Tsiigehtchic. Census counts for 1991 and 2001 showed a 35% increase in population for Tsiigehtchic.

Table 2-2 shows census data for 2001, indicating that 90% of the population of Tsiigehtchic was Aboriginal (mostly Dene).

Table 2-1: Census Counts and Population Estimates for the Gwich'in Communities

Location	Census Population Numbers				Growth 1991–2001 (%)	2003 Estimated Population (No.)
	1986 (No.)	1991 (No.)	1996 (No.)	2001 (No.)		
Northwest Territories	33,830	36,405	35,370	37,360	3	41,872
GSA total	4,257	4,109	4,336	3,850	-6	4,450
Inuvik	3,389	3,206	3,296	2,894	-10	3,435
Fort McPherson	760	759	878	761	1	808
<b>Tsiigehtchic</b>	<b>108</b>	<b>144</b>	<b>162</b>	<b>195</b>	<b>35</b>	<b>207</b>

NOTE:  
Estimates were calculated by the GNWT Bureau of Statistics by allocating the demographic components of growth, down to a community level, using information from a variety of sources

SOURCE: GNWT Bureau of Statistics (2003d, 2004)

Table 2-2: Ethnicity in the Gwich'in Communities (2001 Census Count)

Location	Total Population (No.)	Non- Aboriginal (%)	Aboriginal (%)	Aboriginal Components (Total = 100%)				
				Inuit (%)	Dene (%)	Métis (%)	Multiple (%)	Other Aboriginal (%)
Northwest Territories	37,360	50	50	21	57	19	1	2
Inuvik	2,895	41	59	65	26	9	1	3
Fort McPherson	765	7	93	2	81 <sup>a</sup>	6	4	6 <sup>a</sup>
<b>Tsiigehtchic</b>	<b>195</b>	<b>8</b>	<b>90</b>	<b>6</b>	<b>66</b>	<b>14</b>	<b>9</b>	<b>6</b>

NOTES:  
a Estimated, as the 25% figure given in the census data for Other Aboriginal is incorrect (too large)

SOURCE: GNWT Bureau of Statistics (2003e)

The original 2001 census data had 175 people, or 23% of the Fort McPherson population, in the category of Other Aboriginal, which is the highest in the Northwest Territories. The figure of 6% has been substituted for the 23% figure, because this is the Other Aboriginal total for Tsiigehtchic. Substituting this figure is plausible because Tsiigehtchic originated as a breakaway community from Fort McPherson. The remaining 17% (of the 23%) was added into the Dene category.

Statistics on five-year mobility status for 1996 reported that only 8% of residents in the GSA Aboriginal communities (Tsiigehtchic and Fort McPherson) were interprovincial or international migrants, although just over half of the population in these communities moved to a different residence. The percentage that moved between Northwest Territories communities was higher in Tsiigehtchic than in Fort McPherson (GNWT Bureau of Statistics 2003a).

## 2.3 Economic Activity

Table 2-3 presents 1991 and 2001 occupational groupings for the labour force for the GSA. Although some Statistics Canada changes were made in the occupational categories between 1991 and 2001, at the level of aggregation in the table, these changes make little, if any, difference. Because the Tsiigehtchic male and female labour forces are very small, and because Statistics Canada randomly rounds the frequency data it makes publicly available, the occupational data for Tsiigehtchic in Table 2-3 is not reliable. (Some of the Tsiigehtchic data in later tables, collected by the GWNT Bureau of Statistics and not randomly rounded, is somewhat more reliable.)

**Table 2-3: Labour Force by Standard Occupational Categories in the Gwich'in Communities**

Occupation	Gender	Northwest Territories		GSA Total		Gwich'in Aboriginal Communities		Inuvik		Fort McPherson		Tsiigehtchic	
		1991	2001	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
Labour force, 15+ years	Total (No.)	20,070	20,785	2,180	2,045	370	400	1,810	1,645	315	320	55	88
	Male (No.)	11,225	11,115	1,215	1,085	220	210	995	875	185	160	35	50
	Female (No.)	8,845	9,670	770	765	150	190	935	770	130	160	20	38
All occupations	Total (No.)	19,675	20,425	2,155	2,015	360	385	1,795	1,630	305	305	55	80
	Male (No.)	11,030	10,935	1,200	1,075	205	205	995	870	175	160	30	45
	Female (No.)	8,645	9,490	955	955	155	190	800	765	130	150	25	40
Management, business, finance and administration occupations	Total (%)	18	21	17	23	7	19	19	23	8	18	0	25
	Male (%)	19	19	18	20	7	15	21	21	9	13	0	22
	Female (%)	16	24	15	25	6	21	17	26	8	13	0	50
Clerical occupations	Total (%)	17	9	16	9	13	4	17	10	11	5	18	0
	Male (%)	6	3	5	5	0	5	6	5	0	6	0	0
	Female (%)	32	16	31	15	29	8	31	17	27	10	100	0
Natural and applied sciences, and related occupations	Total (%)	4	7	3	6	0	5	3	6	0	3	0	13
	Male (%)	6	11	4	9	0	10	5	9	0	6	0	22
	Female (%)	1	3	1	3	0	5	1	3	0	7	0	0
Health occupations	Total (%)	3	4	4	5	0	3	5	6	0	3	0	0
	Male (%)	1	1	2	2	0	5	2	2	0	6	0	0
	Female (%)	6	7	7	8	0	0	9	10	0	0	0	0
Social services, education, government service and religious occupations	Total (%)	9	12	8	13	8	17	8	12	10	16	0	19
	Male (%)	6	7	5	6	5	0	6	7	6	0	0	0
	Female (%)	14	17	12	18	13	26	12	16	15	27	0	25
Art, culture, recreation and sport occupations	Total (%)	2	2	2	2	0	0	2	2	0	0	0	0
	Male (%)	2	2	2	1	0	0	2	1	0	0	0	0
	Female (%)	2	3	2	2	0	0	2	3	0	0	0	0

Table 2-3: Labour Force by Standard Occupational Categories in the Gwich'in Communities  
(cont'd)

Occupation	Gender	Northwest Territories		GSA Total		Gwich'in Aboriginal Communities		Inuvik		Fort McPherson		Tsiigehtchic	
		1991	2001	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
Sales and service occupations	Total (%)	18	22	19	21	15	23	19	20	18	25	0	19
	Male (%)	15	18	14	16	5	12	16	17	6	16	0	0
	Female (%)	23	27	25	25	29	32	24	24	35	33	0	25
Trades, transport and equipment operators, and related occupations	Total (%)	16	17	18	19	19	25	18	17	20	23	18	31
	Male (%)	27	30	30	34	34	41	29	33	34	38	33	56
	Female (%)	2	2	3	2	0	5	4	1	0	7	0	0
Occupations unique to the primary industry	Total (%)	5	4	4	3	19	5	1	2	20	7	18	0
	Male (%)	8	8	6	4	29	7	1	3	29	9	33	0
	Female (%)	1	1	1	1	6	0	0	1	8	0	0	0
Occupations unique to the processing, manufacturing and utilities industries	Total (%)	4	1	5	1	6	3	4	1	7	3	0	0
	Male (%)	7	2	7	2	5	5	7	1	6	6	0	0
	Female (%)	1	0	2	0	6	0	1	0	8	0	0	0
Occupations not classified elsewhere	Total (%)	3	0	2	0	3	0	2	0	3	0	0	0
	Male (%)	4	0	4	0	5	0	4	0	6	0	0	0
	Female (%)	1	0	0	0	0	0	0	0	0	0	0	0

NOTES:  
Number and percentage of population, aged 15 years and older  
Because census data is independently randomly rounded (all numbers end in a 5 or 0), totals may not add to 100, especially in small communities (see Section 1.7.3, Limitations of Low-Frequency Data)

SOURCE: Statistics Canada (1991, 2001), prepared by GNWT Bureau of Statistics

Between 1991 and 2001, there were slight increases in the proportions of the Tsiigehtchic population employed in management, the sciences, social service, sales and service, and trades and transport occupations. There were no individuals employed in the health, art and culture, or processing and manufacturing occupations.

Between 1991 and 2001, there were increased numbers of males in the managerial and business, science, and trades and transport occupations in Tsiigehtchic, and reduced numbers in the primary industry occupations. Among females during this decade there were reduced numbers in clerical occupations and increases in managerial and business, social services, and sales and service occupations.

## 2.4 Labour Force

Table 2-4 shows data for the relative participation, employment and unemployment rates of males and females, and the changes in these rates between 1991 and 2001.

**Table 2-4: Participation, Employment and Unemployment in the Gwich'in Communities**

Location	Gender	1991				2001				Difference (2001 minus 1991)		
		Pop. (No.)	Part. (%)	Empl. (%)	Unempl. (%)	Pop. (No.)	Part. (%)	Empl. (%)	Unempl. (%)	Part. (%)	Empl. (%)	Unempl. (%)
NWT	Male	13,540	83	73	12	13,810	80	72	10	-3	-2	-2
	Female	12,145	73	65	10	13,130	74	67	8	1	2	-2
NWT Aboriginal communities <sup>1</sup>	Male	2,425	73	54	27	2,470	66	52	23	-7	-2	-4
	Female	2,010	59	46	22	2,225	58	48	17	-1	2	-5
GSA total	Male	1,555	81	68	15	1,375	78	72	9	-3	4	-6
	Female	1,375	72	64	11	1,355	71	65	9	-1	1	-2
GSA Aboriginal communities total	Male	305	69	42	34	335	61	49	22	-8	7	-12
	Female	275	56	47	19	325	60	51	18	4	4	-1
Inuvik	Male	1,235	84	74	11	1,040	84	79	6	0	5	-5
	Female	1,100	75	68	10	1,030	75	70	7	-5	2	-3
Fort McPherson	Male	270	68	43	35	270	59	46	22	-9	3	-13
	Female	235	58	47	15	265	60	49	16	2	2	1
<b>Tsiigehtchic</b>	<b>Male</b>	<b>50</b>	<b>70</b>	<b>40</b>	<b>29</b>	<b>65</b>	<b>69</b>	<b>62</b>	<b>22</b>	<b>-1</b>	<b>22</b>	<b>-7</b>
	<b>Female</b>	<b>40</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>60</b>	<b>58</b>	<b>58</b>	<b>29</b>	<b>8</b>	<b>8</b>	<b>-21</b>

NOTES:

NWT = Northwest Territories

Pop. = population aged 15 years and older

Part. = participation rate, which is the percentage of population, aged 15 years and older in the labour force

Empl. = employment rate, which is the percentage of population, aged 15 years and older employed during the week before the survey

Unempl. = unemployment rate, which is the percentage of the labour force that was unemployed during the week before the survey

<sup>1</sup> All study area communities in the Northwest Territories except Inuvik, Norman Wells, Fort Simpson, Yellowknife, Hay River and Enterprise

Statistics for very small communities are uncertain and should be considered with caution

Because census data is independently randomly rounded (all numbers end in a 5 or 0), totals may not add to 100, especially in small communities (see Section 1.7.3, Limitations of Low-Frequency Data)

SOURCE: Statistics Canada (1991, 2001)

In 2001 the participation rate for males in Tsiigehtchic was 69%, and the employment and unemployment rates were 62% and 22% for males. For Tsiigehtchic women the participation rate was 58% in 2001, and the employment and unemployment rates were 58% and 29%.

Between 1991 and 2001 the employment rate increased by 22% for males and 8% for females in Tsiigehtchic. In Table 2-5, data for 1999 shows that the potential labour supply was 32% of the working-age population in Tsiigehtchic. The profile of this potential labour supply indicated that 82% need training and 67% would be interested in rotational work.

**Table 2-5: Profile of the Working-Age Population in the Gwich'in Communities (1999)**

<b>Profile Category</b>	<b>NWT Aboriginal Communities<sup>1</sup></b>	<b>GSA Total</b>	<b>Inuvik</b>	<b>GSA Aboriginal Communities Total</b>	<b>Fort McPherson</b>	<b>Tsiigehtchic</b>
Population 15+ (No.)	5,821	3,078	2,347	731	628	<b>103</b>
Potential labour supply (No.)	1,797	568	336	232	199	<b>33</b>
Potential labour supply <sup>2</sup> (%)	31	18	14	32	32	<b>32</b>
Need training <sup>3</sup> (%)	53	59	52	83	83	<b>82</b>
Would do rotational work <sup>3</sup> (%)	73	55	47	81	83	<b>67</b>
Male <sup>3</sup> (%)	60	52	51	54	57	<b>27</b>
Aboriginal <sup>3</sup> (%)	94	86	81	99	99	<b>100</b>
Less than high school education <sup>3</sup> (%)	68	59	57	67	69	<b>58</b>
NOTES:						
1 All study area communities in the Northwest Territories, except Inuvik, Norman Wells, Fort Simpson, Yellowknife, Hay River and Enterprise						
2 Percentage of population, aged 15 years and older						
3 Percentage of potential labour force						
SOURCE: Calculated using GNWT Bureau of Statistics (1999)						

## **2.5 Income Sources and Amounts**

There were 56 tax-paying companies in the BDR in 2000. Total corporate income tax paid was about \$1,284,076 (see Table 2-6).

Table 2-6: Corporate Tax Status in the Northwest Territories

Region	Year	Corporate Income Tax Paid (\$)	Tax-Paying Companies	Non Tax- Paying Companies	Total Companies
Northwest Territories	1995	32,650,756	895	1,158	2,053
	1996	31,369,701	887	1,193	2,080
	1997	27,024,079	932	1,356	2,288
	1998	23,965,218	953	1,335	2,288
	1999	89,778,543	957	1,342	2,299
	2000	382,558,653	920	1,126	2,046
	2001	80,931,551	–	–	–
Yellowknife region <sup>1</sup>	1995	31,996,748	721	817	1,538
	1996	30,715,198	710	830	1,540
	1997	26,312,437	757	974	1,731
	1998	23,128,104	774	955	1,729
	1999	88,148,015	811	1,021	1,832
	2000	380,858,591	771	817	1,588
<b>BDR<sup>2</sup></b>	<b>1995</b>	<b>141,614</b>	<b>43</b>	<b>116</b>	159
	<b>1996</b>	<b>286,548</b>	<b>56</b>	<b>115</b>	171
	<b>1997</b>	<b>153,810</b>	<b>55</b>	<b>123</b>	178
	<b>1998</b>	<b>314,806</b>	<b>60</b>	<b>116</b>	176
	<b>1999</b>	<b>691,900</b>	<b>54</b>	<b>96</b>	150
	<b>2000</b>	<b>1,284,076</b>	<b>56</b>	<b>98</b>	154
Sahtu Settlement Area (SSA)	1995	64,634	21	44	65
	1996	51,939	18	52	70
	1997	82,048	19	57	76
	1998	61,303	15	60	75
	1999	32,035	9	37	46
	2000	47,898	15	29	44
Deh Cho Region (DCR)	1995	40,256	18	38	56
	1996	40,786	20	38	58
	1997	40,839	17	39	56
	1998	41,665	12	39	63
	1999	238,010	13	38	51
	2000	41,665	12	39	51
NOTES:					
– = data not available					
1 Yellowknife region includes Yellowknife, and the N'dilo and Dettah suburbs					
2 Only data aggregated for Inuvialuit and Gwich'in communities (BDR) is available					
Income tax amounts are not adjusted for inflation					
SOURCE: GNWT Finance (2002)					

Table 2-7 shows that average employment income per tax filer in Tsiigehtchic in 2001 was about \$20,000 per year, which was the lowest in the GSA. Reflecting changes in government policy, the average monthly number of income support beneficiaries decreased substantially between 1996 and 2003 in all the GSA communities, including Tsiigehtchic.

**Table 2-7: Employment Income and Income Support Beneficiaries in the Gwich'in Communities**

Location	Average Employment Income			No. of Income Support Beneficiaries <sup>1</sup>			
	1996 (\$)	1999 (\$)	2001 (\$)	1996	1999	2001	2003
Northwest Territories	33,748	35,450	38,497	102	86	59	51
NWT Aboriginal communities <sup>2</sup>	22,228	23,551	26,135	–	–	–	90
GSA total <sup>3</sup>	30,794	32,806	36,021	123	125	64	51
Inuvik	33,220	35,656	39,125	103	102	60	50
GSA Aboriginal communities total	20,872	20,014	23,123	185	193	76	62
Fort McPherson	20,872	20,014	23,700	194	193	79	52
<b>Tsiigehtchic</b>	–	–	<b>20,443</b>	<b>138</b>	<b>194</b>	<b>63</b>	<b>48</b>

NOTES:  
 – = data not available, or held confidential because of low frequencies  
 1 Average monthly number of recipients and dependents per 1,000 population, calculated based on population estimates for 1996 to 2002 (prepared by GNWT Bureau of Statistics)  
 2 Does not include data for Sachs Harbour  
 3 GSA totals do not include Tsiigehtchic for 1996 to 1999  
 Dollar amounts not adjusted for inflation

SOURCE: GNWT Bureau of Statistics (2002a, 2003g)

## 2.6 Cost of Living

The data for cost of living comes from:

- a 2000 cost-of-living index that uses Edmonton as a base
- a 2001 food price index that uses Yellowknife as a base

The data in Table 2-8 shows the cost of living in Tsiigehtchic as 50 to 55% higher than in Edmonton, and the food-price index as 30% higher than in Yellowknife.

Table 2-8: Cost of Living Differentials for the Gwich'in Communities

Region	Community	Cost of Living Differential <sup>1</sup> (2000)	Estimated Food Price Index <sup>2</sup> (2001)
GSA	Inuvik	145–150	147
	Fort McPherson	150–155	150
	<b>Tsiighehtchic</b>	<b>150–155</b>	<b>130</b>
NOTES: 1 Cost of living differentials are used to calculate the Government of Canada federal isolated post allowances and use Edmonton as a base, e.g., Edmonton = 100 2 Food price indexes are calculated using Yellowknife as a base, e.g., Yellowknife = 100			
SOURCE: GNWT Bureau of Statistics (2003g)			



### **3 INFRASTRUCTURE AND COMMUNITY SERVICES**

#### **3.1 Introduction**

This section describes the physical infrastructure and services that affect the quality of life of people, families and the communities in which they live. Included are:

- transportation infrastructure
- utilities, e.g., water and waste disposal
- energy and communications
- housing
- local recreation facilities

A discussion on governance is also included in this section.

#### **3.2 Transportation Infrastructure**

Tsiigehtchic has an all-weather highway connection to the south and to Inuvik with seasonal restrictions, along with barge-based resupply in the summer (see Table 3-1). Tsiigehtchic has no scheduled flights connecting it with any of the communities and no rail access or bus service.

#### **3.3 Utilities, Energy and Communications**

Table 3-2 shows that in Tsiigehtchic, water is distributed by truck, following treatment, and liquid waste is discharged by pump-out or is bagged and hauled away. Solid waste is buried in a landfill site. Three generators provide power, with 200 kW of spare capacity. Tsiigehtchic uses P-50 fuel oil as the heating fuel.

Table 3-3 describes the existing communications infrastructure in the GSA communities. Tsiigehtchic has television, radio and newspapers, along with Internet connections accessible to the public and mail service four times per week.

Table 3-1: Transportation Infrastructure in the Gwich'in Communities (2001)

Transportation Mode	Inuvik	Fort McPherson	Tsiigehtchic
<b>Road</b>			
Road access	All-weather road, seasonally restricted	All-weather road, seasonally restricted	<b>All-weather road, seasonally restricted</b>
Average daily traffic (No. of vehicles)	2001 = 1,120 2000 = 1,120	2001 = 80 2000 = 80	<b>2001 = 80 2000 = 80</b>
Highway	Dempster Highway No. 8	Dempster Highway No. 8	<b>Dempster Highway No. 8</b>
Road surface	Paved, dust-controlled gravel, untreated gravel	Paved, dust-controlled gravel, untreated gravel	<b>Paved, dust-controlled gravel, untreated gravel</b>
Average opening and closing dates (1997–2000), winter roads and ice bridges	November 28 to April 29	November 13 to May 1	<b>November 13 to May 1</b>
<b>Rail</b>			
Rail access	None	None	<b>None</b>
<b>Water</b>			
Marine resupply deliveries per week	7	2	<b>1</b>
Ownership of facility	T, P	P	<b>T</b>
Resupply facility classification	A	C	<b>C</b>
Small boating facilities	Jet float dock, private docks, boat launch	Beach landings	<b>Jet float dock, steel frame dock</b>
<b>Air</b>			
Runway length	1,829 m	1,067 m	<b>N/A</b>
Runway surface	Asphalt	Gravel	<b>N/A</b>
Owner	GNWT	GNWT	<b>N/A</b>
Critical aircraft (largest aircraft able to use runway)	B737	Dornier 228	<b>N/A</b>
Weather and communication type	FSS	CARS	<b>N/A</b>
Navigational aids	ILS, DME, NDB	NDB	<b>N/A</b>

Table 3-1: Transportation Infrastructure in the Gwich'in Communities (2001) (cont'd)

Transportation Mode	Inuvik	Fort McPherson	Tsiigehtchic
<p>NOTES:</p> <p>N/A = not applicable</p> <p>Water Transportation:</p> <p>T = facility owned by federal government</p> <p>P = privately owned</p> <p>Water Facility Resupply Classification:</p> <p>A = &gt;10,000 t cargo and fuel in and out per year, protected access at all water levels, secure moorage for loading and unloading, access for heavy equipment, secure marshalling and storage site</p> <p>B = 2,000–10,000 t cargo and fuel in and out per year, secure moorage at all water levels, access 4 hours/day, access for heavy equipment, secure marshalling and storage site</p> <p>C = &lt;2,000 t cargo and fuel in and out per year, access for loading and unloading 4 hours/day, access for heavy equipment, secure marshalling and storage site</p> <p>Air Transportation:</p> <p>CARS = community airport radio station</p> <p>DME = distance measuring equipment</p> <p>FSS = flight service station</p> <p>GNWT = Government of the Northwest Territories</p> <p>ILS = instrument landing system</p> <p>NDB = nondirectional beacon</p>			
<p>SOURCE: GNWT Transportation (1995, 2000, 2001)</p>			

**Table 3-2: Utilities Infrastructure in the Gwich'in Communities (2001)**

Utility	Inuvik	Fort McPherson	Tsiigehtchic
<b>Water</b>			
Delivery system	Trucked or piped	Trucked or piped	Trucked
Water source	Winter: East Channel, Mackenzie River Summer: Three-Mile Lake	Water Lake	Tso Lake
Water treatment	Built in 1980, the treatment plant has a capacity of 5,239 m <sup>3</sup> /day and can serve a population of 8,000	Neptune Water Boy WB 133 treatment package installed in 1990	Chlorination system consists of two 114 L polyethylene tanks and a Wallace and Tiernan 1/20-hp mixer to mix chlorine solution
Water quality	Good chemical quality for domestic use	Good chemical quality for domestic use	Good chemical quality for domestic use
<b>Liquid Waste</b>			
Type of system	Bagged or piped	Pumpout or piped	Bagged or pumpout
Sewage disposal	20 ha sewage lagoon constructed using berms along three sides of a low-lying area. Outlet weir discharges through a natural channel to the East Channel below the town	Old shale borrow site, 8 km from the community along the Dempster Highway. Sewage eventually drains into Peel Channel downstream from the community. Piped sewage is discharged into a 101 ha lake east of community	Lake E situated 11.5 km west of the community
<b>Solid Waste</b>			
Type of disposal	500 m x 350 m solid waste site. Site is covered with clay-based silty soil and coarse sand as required. Packer truck is used for added compaction	Buried in a landfill	Modified landfill is located just south of Lake E
<b>Electrical Power</b>			
Installed capacity	12,250 kW	1,800 kW	400 kW
Source	natural gas turbines (4,900 kW) diesel (5,500 kW)	3 generators	3 small generators
Peak load requirement	5,000 kW	752 kW	187 kW
Spare power capacity <sup>1</sup>	7,000 kW	1,000 kW	200 kW
<b>Heating Fuel</b>			
Types of heating fuel	P-50 fuel oil, natural gas (local supply)	P-50 fuel oil	P-50 fuel oil
NOTE: 1 No allowance made for reserve power requirements			
SOURCES: GNWT MACA (2002), Northwest Territories Power Commission (2002), Watt (2004, personal communication)			

**Table 3-3: Selected Communications Infrastructure in the Gwich'in Communities (2001)**

Communication Type	Inuvik	Fort McPherson	Tsiigehtchic
Cellular phone	Yes	No	No
Internet	Sympatico, 10 public	No private, 2 public	No private, 2 public
Transmission of telecommunications	Microwave	Microwave and LPRT system	Microwave
Radio	CBC, local production centre	CBC, community radio station	CBC
Television	CBC via cable	CBC, cable	CBC
Newspaper coverage	<i>News/North, Inuvik Drum</i>	<i>News/North</i>	<i>News/North</i>
Frequency of mail delivery per week	5 times	4 times	4 times
NOTES: LPRT = low-power relay transmitter			
SOURCES: GNWT Resources, Wildlife and Economic Development (RWED) (1999), NorthwestTel personnel (2001, personal communication), GNWT MACA (2002)			

### 3.4 Housing and Recreation

Table 3-4 shows that the percentage of households needing major repairs in Tsiigehtchic is higher than in the Northwest Territories as a whole. According to 2001 census data, 25% of the housing in Tsiigehtchic was in need of major repairs, 50% of the housing needed regular maintenance and 17% needed minor repairs. The number of people per household is increasing in Tsiigehtchic (Statistics Canada 2003a, Northwest Territories Housing Corporation 2000).

**Table 3-4: Housing and Repairs Needed in the Gwich'in Communities (2001)**

Location	Total Houses (No.)	Needs Regular Maintenance <sup>1</sup> (%)	Needs Minor Repairs <sup>2</sup> (%)	Needs Major Repairs <sup>3</sup> (%)
Northwest Territories	12,565	52	32	16
Inuvik	1,015	45	36	18
Fort McPherson	240	54	27	21
<b>Tsiigehtchic</b>	<b>60</b>	<b>50</b>	<b>17</b>	<b>25</b>
NOTES: 1 Regular maintenance refers to such conditions as requiring painting or furnace cleaning 2 Minor repairs refers to such conditions as missing or loose floor tiles, brick or shingles, or to defective steps, railing or siding 3 Major repairs refers to such conditions as defective plumbing or electrical wiring, or structural repairs to walls, floors or ceilings				
SOURCE: Statistics Canada (2003a)				

Current economic growth conditions in the Mackenzie Delta have created a housing shortage in Inuvik, but this trend does not extend to Tsiigehtchic.

Recreation facilities in the Gwich'in communities reflect the size of the communities. Tsiigehtchic has a community hall and community centre, playgrounds, and a school gym (GNWT RWED 2002e).

### 3.5 Governance

Included in governance are the planning and decision-making organizations, such as band councils, community corporations, and town and city councils. The resources made available to these organizations by the GNWT and, in some cases, the Government of Canada, are also included.

All of the existing governance relationships between the federal and territorial governments, and the Aboriginal people, their organizations and communities in the Northwest Territories are in the process of change through ongoing negotiations. These ongoing processes involve negotiations to achieve devolution of authority, and to confer self-government responsibilities on Aboriginal peoples.

The Gwich'in signed a land claims agreement that defined the boundaries of the GSA and established it as a political entity in 1992. Inuvik, Fort McPherson and Tsiigehtchic are within this area. The GSA is administered by several organizations responsible for specific functions. The Gwich'in Tribal Council is responsible for administering the land claim. Other organizations with key responsibilities are the:

- Gwich'in Renewable Resources Board
- Gwich'in Land and Water Board
- Gwich'in Land Use Planning Board (GLUPB)

The Inuvialuit and Gwich'in are in the process of negotiating an agreement with the Governments of Canada and the Northwest Territories, under which they will share self-government of their combined areas, the BDR. The *Gwich'in and Inuvialuit Self-Government Agreement-in-Principle for the Beaufort Delta Region*, the first step towards the final agreement, was signed on April 16, 2003 by:

- the Gwich'in, as represented by the Gwich'in Tribal council
- the Inuvialuit, as represented by the Inuvialuit Regional Corporation
- the GNWT
- the Government of Canada

## 4 INDIVIDUAL, FAMILY AND COMMUNITY WELLNESS

### 4.1 Introduction

This section describes community wellness in the study area, which refers to the physical, emotional, social and economic well-being of all components of a community, including individuals and families.

Aboriginal people have long recognized the interaction and interdependence of physical, emotional, mental and social well-being. Viewing the spiritual as the centrally important component, some Aboriginal communities have formed healing circles to deal with family issues, sentencing and rehabilitation of offenders, and the debilitating problems of those who experienced various forms of abuse while attending residential schools.

In western healing and helping professions, recognizing a holistic approach to wellness has been much more recent. GNWT HSS personnel have sought to deal with intertwined physical, social and emotional health concerns using a community wellness approach for almost a decade (GNWT HSS 1995).

The present emphasis on a community wellness approach by the GNWT HSS originated from an assessment in 2000 of the challenges and problems in wellness services (GNWT HSS 2001a). The most recent evidence of the GNWT's commitment to health and well-being is found in *Health Promotion Strategy* (GNWT Bureau of Statistics 2003h), which provides a framework for increased investment in promotion and prevention activities at the territorial, regional, local and individual levels.

The influence of these interrelated concerns is seen in this section on individual, family and community wellness, which deals with wellness-conserving facilities and services, and the conditions and activities of people to which these services must respond. Information is provided on:

- health conditions
- health care facilities and services
- family concerns and community conditions
- social service facilities and services
- education and training

An important achievement of GNWT HSS has been the sharp reduction in new cases of tuberculosis, once a very serious health problem for northern people. With implementation of the *Action Plan to Strengthen Tuberculosis Management and Control in the Northwest Territories*, the numbers of new cases per year have been steadily reduced, from 24 in 1996 to four in 2002. Of the four in 2002, two were immigrants (Case 2003).

Currently, the most serious addiction in the Northwest Territories is alcohol, which is the most frequent source of wellness problems. According to a recent coroner's report, 40% of health costs relate to addictions or mental health problems (Penney 2003).

The effects of alcohol abuse include:

- foetal alcohol syndrome (FAS) or foetal alcohol effects (FAE)
- sexual abuse of family members
- sexually transmitted infections (STIs)

Additional effects of alcohol abuse are also discussed in the following sections.

The most costly effect is the birth of FAS/FAE babies to mothers abusing alcohol. Studies have shown that hospital use is many times higher by FAS/FAE children than by other children (Chatel 2003). These children are typically unable to learn from experience and thus have severe behavioural problems that may be life long. As a result, the lifetime health and social costs are estimated to be more than \$2 million per FAS/FAE person (Carey 2003). No further discussion of FAS/FAE children is provided here because statistical data is unavailable. This is because most births in the Northwest Territories are attended by nurse-midwives rather than by physicians, and only physicians can make a FAS/FAE diagnosis. However, from the accounts of nurses and teachers who work with FAS/FAE children in school, many such children exist in the Northwest Territories.

Incidents of sexual abuse are notably under-reported, thus the available data is unreliable (National Crime Prevention Centre 2001). Alcohol abuse and mental disorders are intimately related, as childhood abuse may lead to both, and increases in one may lead to parallel increases in the other. The RCMP reported over 400 cases of sexual assault for 2000 and 2001 in the Northwest Territories. Northwest Territories health centres report seeing 300 to 350 people annually for assessment and counselling related to sexual abuse or assault. Sexual abuse of children is the least acknowledged of offences, in part because the abuser is often well-known to the victim and his or her family. Between 2000 and 2003, child protection workers investigated 350 cases of suspected sexual abuse of children. This number should not be seen as a complete count, as many such incidents go unreported. Sexual abuse of children may infect them with STIs, and 15 children under 12 years of age were found to have STIs between 1998 and 2003 in the Northwest Territories. The STI incidence among children aged 12 to 15 years in the Northwest Territories more than doubled during this period, from 44 to 90 cases per year (White 2003).

The rates for STIs are very high in the Northwest Territories, and the contexts in which these infections are transmitted are often associated with alcohol consumption. In recent years, chlamydia rates in the Northwest Territories were six times as high as Canadian rates, and gonorrhoea infection rates were over

20 times the Canadian rate. Among those aged 16 to 18 years, a 63% increase occurred between 1996 and 2001 (Harrison 2002). Community-specific STI data is provided in the following sections.

A final health concern in the Northwest Territories is suicide, both because the incidence of suicide is so high relative to the rest of Canada, and because so many are teenage suicides. Because of the unreliability of suicide data, given the small populations, this discussion is based on rates for the Northwest Territories as a whole.

The three-year average age-adjusted suicide rates, which compensate for differences in age distributions, were twice as high in the Northwest Territories as in Canada for 1999 to 2001 (Little 2002). The 1998 to 2002 suicide rate of youths aged 10 to 19 years in the Northwest Territories was four times the Canadian rate, and the rate for those aged 20 to 29 years in the Northwest Territories was almost three times the Canadian rate. Data on hospitalizations of females for self-inflicted injuries is relevant because of women's relatively frequent rates of attempted unsuccessful suicide. The rate of such hospitalizations in 1995 to 1999 for Northwest Territories females aged 10 to 19 years was over three times as high as the rate for Canadian females of this age (Little 2003).

Suicide deeply affects small Aboriginal communities because community members are so interrelated, with many residents being relatives of the victim. Mental health workers provide counsel, but community recovery from a suicide is a slow process.

## 4.2 Health Conditions

The smoking rate among adults aged 18 years and over was 65% in Tsiigehtchic in 1999 (GNWT Bureau of Statistics 1999). The rate for the Northwest Territories as a whole was 42%.

Table 4-1 shows that the rates for respiratory diseases treated by physicians in Tsiigehtchic were higher than the Fort McPherson rates, but lower than the Inuvik rates. Rates in all the GSA communities fluctuated, but did decrease over time.

Table 4-2 shows that the three-year average rates of infectious and parasitic diseases in Tsiigehtchic have tended generally to increase between 1994–1996 and 2000–2002.

**Table 4-1: Cases of Respiratory Diseases Treated by Physicians in the Gwich'in Communities**

Location	1994–1996 (No./1,000)	1995–1997 (No./1,000)	1996–1998 (No./1,000)	1997–1999 (No./1,000)	1998–2000 (No./1,000)	1999–2001 (No./1,000)	2000–2002 (No./1,000)
NWT	638	612	587	559	543	504	481
GSA total	604	638	672	605	562	500	518
Inuvik	702	755	802	723	673	606	628
GSA Aboriginal communities total	286	262	265	238	224	177	177
Fort McPherson	272	244	247	217	208	159	163
<b>Tsiigehtchic</b>	<b>363</b>	<b>357</b>	<b>361</b>	<b>350</b>	<b>303</b>	<b>263</b>	<b>236</b>
NOTES: Numbers are claim counts by ICD-9 code for the particular group of conditions Three-year average rates per 1,000 population							
SOURCE: GNWT HSS (2003b)							

**Table 4-2: Cases of Infectious and Parasitic Diseases Treated by Physicians in the Gwich'in Communities**

Location	1994–1996 (No./1,000)	1995–1997 (No./1,000)	1996–1998 (No./1,000)	1997–1999 (No./1,000)	1998–2000 (No./1,000)	1999–2001 (No./1,000)	2000–2002 (No./1,000)
NWT	253	245	250	235	232	222	218
BDR total	158	141	140	125	125	126	130
GSA total	197	179	176	157	154	159	167
Inuvik	240	217	214	191	177	177	185
GSA Aboriginal communities total	55	55	58	49	81	104	112
Fort McPherson	53	51	51	37	78	91	94
<b>Tsiigehtchic</b>	<b>69</b>	<b>78</b>	<b>96</b>	<b>112</b>	<b>95</b>	<b>165</b>	<b>190</b>
NOTES: Numbers are claim counts by ICD-9 code for the particular group of conditions Claim frequencies for each community were divided by the population of the community, giving a figure, usually a decimal, for the number of cases per person. This was then multiplied by 1,000. Three-year average rates per 1,000 population							
SOURCE: GNWT HSS (2003b)							

Table 4-3 shows that three-year average rates for STIs, for both sexes and all ages, in Tsiigehtchic were the highest in the GSA in 2000–2002, having increased considerably in 1998–2000 and 1999–2001.

**Table 4-3: Sexually Transmitted Infections in the Gwich'in Communities**

Location	1994–1996 (No./1,000)	1995–1997 (No./1,000)	1996–1998 (No./1,000)	1997–1999 (No./1,000)	1998–2000 (No./1,000)	1999–2001 (No./1,000)	2000–2002 (No./1,000)
NWT	11	11	12	12	14	15	16
BDR total	19	17	19	20	23	23	24
GSA total	21	20	20	22	23	22	22
Inuvik	20	17	19	22	24	22	21
GSA Aboriginal communities total	27	29	25	23	23	24	25
Fort McPherson	30	22	19	21	23	25	21
<b>Tsiigehtchic</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>17</b>	<b>25</b>	<b>31</b>	<b>28</b>
NOTES: STIs include chlamydia, gonorrhoea and hepatitis B Calculated based upon population estimates prepared by GNWT Bureau of Statistics Three-year average rates per 1,000 population, both sexes and all ages							
SOURCE: GNWT HSS (2003b)							

Table 4-4 indicates that rate of physician treatments for accidents, injuries and poisonings in Tsiigehtchic decreased steadily between 1995–1997 and 2000–2002. However, the rate was still higher than the rate for Fort McPherson, although lower than the Inuvik rate, in 2000–2002.

**Table 4-4: Cases of Accidents, Injuries and Poisonings Treated by Physicians in the Gwich'in Communities**

Location	1994–1996 (No./1,000)	1995–1997 (No./1,000)	1996–1998 (No./1,000)	1997–1999 (No./1,000)	1998–2000 (No./1,000)	1999–2001 (No./1,000)	2000–2002 (No./1,000)
NWT	442	424	408	399	394	371	353
GSA total	442	448	451	441	430	410	400
Inuvik	495	498	506	499	494	480	473
GSA Aboriginal communities total	267	287	276	261	234	197	173
Fort McPherson	231	233	232	227	215	175	156
<b>Tsiigehtchic</b>	<b>468</b>	<b>580</b>	<b>509</b>	<b>441</b>	<b>327</b>	<b>302</b>	<b>246</b>
NOTES: Numbers are claim counts by ICD-9 code for the particular group of conditions Three-year average rates per 1,000 population							
SOURCE: GNWT HSS (2003b)							

Between 1994 and 1998 there were no suicides in Tsiigehtchic. The GSA had the second lowest suicide rate, 18 per 100,000, of any study area region between 1994 and 1998. However, the suicide rate for the Gwich'in communities was half again higher than the Northwest Territories as a whole, which was 12 per 100,000 (GNWT Bureau of Statistics 2001a).

Table 4-5 shows death rates for the Gwich'in communities. From 1994 to 1998, 19% of deaths were accidental in Inuvik and 33% were accidental in Fort McPherson. No data is available for Tsiigehtchic.

**Table 4-5: Deaths from Injuries in the Gwich'in Communities (1994 to 1998 average)**

Location	Deaths from Injuries			Average Number of Deaths
	Average Number	Per 1,000 Population	Percentage of Total Deaths	
NWT	28.0	0.68	20	143.0
BDR total	9.0	1.27	26	34.5
Inuvik	3.0	0.89	19	16
Fort McPherson	2.0	2.29	33	6
<b>Tsiigehtchic</b>	–	–	–	–
NOTE: – = data not available or too small to be expressed Five-year average numbers, rates and percentages				
SOURCE: GNWT Bureau of Statistics (2003a)				

Table 4-6 shows the three-year averaged rates of mental disorders treated by physicians between 1994–1996 and 2000–2002. These rates in Tsiigehtchic after 1998–2000 were the lowest in the GSA. All of the rates in the GSA declined between 1996–1998 and 2000–2002.

**Table 4-6: Cases of Mental Disorder Treated by Physicians in the Gwich'in Communities**

Location	1994–1996 (No./1,000)	1995–1997 (No./1,000)	1996–1998 (No./1,000)	1997–1999 (No./1,000)	1998–2000 (No./1,000)	1999–2001 (No./1,000)	2000–2002 (No./1,000)
NWT	335	338	355	367	369	349	337
BDR total	281	279	292	291	260	216	216
GSA total	350	338	353	348	308	252	253
Inuvik	413	396	413	414	363	294	295
GSA Aboriginal communities total	146	153	166	144	138	122	123
Fort McPherson	132	134	154	138	140	124	124
<b>Tsiigehtchic</b>	<b>229</b>	<b>251</b>	<b>230</b>	<b>173</b>	<b>133</b>	<b>112</b>	<b>117</b>
NOTES: Numbers are claim counts by ICD-9 code for the particular group of conditions Three-year average rates per 1,000 population							
SOURCE: GNWT HSS (2003b)							

The Gwich'in, through the Assembly of First Nations, participated in the Mental Health Working Group that produced the *Mental Wellness Framework* (see the EIS, Volume 4, Section 4.2.1, Health Conditions [ISR]). The publication states that *current responses to mental wellness among [Aboriginal people] are not working* and that Aboriginal solutions to Aboriginal wellness are needed (Mental Health Working Group et al. 2002: F5).

### 4.3 Health Care Facilities and Services

The Inuvialuit Regional Health and Social Services Authority (IRHSSA) provides health and social services to the GSA communities. Table 4-7 shows the facilities providing services in each of the Gwich'in communities. Tsiigehtchic has a health centre. The Inuvik Regional Hospital serves the GSA. Air ambulances are stationed in Inuvik for speedy response to medical emergencies in the other communities.

**Table 4-7: Health Care Facilities in the Gwich'in Settlement Area (2004)**

Location	Facility Name	Description
Inuvik	<ul style="list-style-type: none"> <li>• Billy Moore Home</li> <li>• Charlotte Vehus Group Home</li> <li>• Inuvik Regional Hospital</li> <li>• Inuvik Public Health</li> <li>• Inuvik Social Services</li> <li>• Inuvik Senior Citizens' Centre</li> <li>• Inuvik Transition House</li> <li>• Reliance Group Home</li> </ul>	<ul style="list-style-type: none"> <li>• Adult handicapped group home</li> <li>• Adult handicapped group home</li> <li>• Regional hospital</li> <li>• Public health unit</li> <li>• Social services office</li> <li>• Independent living</li> <li>• Women's and children's shelter</li> <li>• Child welfare facility</li> </ul>
Fort McPherson	<ul style="list-style-type: none"> <li>• William Firth Health Centre</li> <li>• Fort McPherson Social Services</li> </ul>	<ul style="list-style-type: none"> <li>• Health centre</li> <li>• Social services office</li> </ul>
<b>Tsiigehtchic</b>	<ul style="list-style-type: none"> <li>• <b>Tsiigehtchic Social Services Centre</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Health centre; social services via Inuvik</b></li> </ul>
NOTE: A health centre is staffed by one or more registered nurses		
SOURCE: GNWT HSS (2004)		

### 4.4 Family and Community Conditions

According to RCMP and GNWT HSS personnel, alcohol abuse is a common factor in most of the problems they deal with. Table 4-8 indicates that alcohol-related hospitalizations for Tsiigehtchic were always much lower than the Inuvik rates, and tended to increase until 1995–1998 and to fall after 1997–1999. However, as the population of Tsiigehtchic is small, the rates in the table and the trends discussed might be unreliable.

**Table 4-8: Hospitalizations for Alcohol-Related Illnesses in the Gwich'in Communities**

Location	1994–1996 (No./100,000)	1995–1997 (No./100,000)	1996–1998 (No./100,000)	1997–1999 (No./100,000)	1998–2000 (No./100,000)	1999–2001 (No./100,000)
NWT	367	391	430	464	460	443
BDR total	405	428	463	452	373	378
Inuvik	644	692	732	730	580	618
Fort McPherson	256	256	332	299	335	330
<b>Tsiigehtchic</b>	<b>198</b>	<b>198</b>	<b>390</b>	<b>390</b>	<b>364</b>	<b>0</b>
NOTES: 0 = no hospitalization cases Three-year average rates per 100,000 population						
SOURCE: GNWT HSS (2003b)						

Because there is no RCMP detachment in Tsiigehtchic, there are no alcohol offences or other crime rates available for this community. The alcohol offence rate in Inuvik was consistently high, possibly because Inuvik is the location of the regional liquor store.

Between 1994 and 1998 in the Gwich'in Aboriginal communities, there was a slight decline in births to teenagers as a percentage of total births (GNWT Bureau of Statistics 2002b).

Table 4-9 shows that the rates of spousal assaults for the study area and the GSA in 2000 and 2001. Because there is no RCMP detachment in Tsiigehtchic, there are no spousal assault or other crime rates available for this community.

**Table 4-9: Spousal Assaults in the Gwich'in Communities**

Location	1997 (No./1,000)	1998 (No./1,000)	1999 (No./1,000)	2000 (No./1,000)	2001 (No./1,000)
NWT study area <sup>1</sup>	10	25	24	19	17
GSA total	29	41	40	44	36
Inuvik	37	47	46	53	43
Fort McPherson <sup>2</sup>	2	20	22	14	10
NOTES: 1 Includes all of the communities in the ISR, GSA, SSA and DCR 2 The Fort McPherson RCMP detachment polices Tsiigehtchic Sachs Harbour has been policed out of Inuvik since 1995 Rates per 1,000 population					
SOURCE: RCMP local detachments (2002)					

A family violence shelter in Inuvik serves GSA residents. Social service personnel provide women in need from Tsiigehtchic and other communities with transportation to the Inuvik shelter.

Table 4-10 shows that between 1997–1998 and 2002–2003, the number of children taken into care in both the GSA as a whole and Inuvik increased relatively steadily. The data for Tsiigehtchic was suppressed to protect confidentiality.

**Table 4-10: Children Taken into Care in the Gwich'in Communities**

Location	1995–1996 (No./1,000)	1997–1998 (No./1,000)	1998–1999 (No./1,000)	2000–2001 <sup>1</sup> (No./1,000)	2001–2002 <sup>1</sup> (No./1,000)	2002–2003 <sup>1</sup> (No./1,000)
NWT	14	13	15	14	16	17
NWT Aboriginal communities <sup>2</sup>	18	25	25	19	19	22
GSA total	16	20	25	24	25	31
Inuvik	14	12	25	20	22	27
Fort McPherson	5	15	26	43	44	55
<b>Tsiigehtchic</b>	–	–	–	–	–	–

NOTES:  
 – = data not available or too small to be expressed  
 1 Numbers of children taken into care during some part of the fiscal year, including plan of care, supervision, apprehension, temporary custody and permanent custody children  
 2 All study area communities in the Northwest Territories, except Inuvik, Norman Wells, Fort Simpson, Yellowknife, Hay River and Enterprise  
 Average rates per 1,000 total population for fiscal years, calculated based upon population estimates prepared by GNWT Bureau of Statistics

SOURCE: GNWT HSS (2003b)

Table 4-11 shows that *Young Offenders Act* offence rates rose between 1997 and 1998 in the GSA, fell until 2001 and then rose again. Because there is no RCMP detachment in Tsiigehtchic there are no *Young Offenders Act* or other crime rates available for this community.

**Table 4-11: Young Offenders Act Offences in the Gwich'in Communities**

Location	1997 (No./1,000)	1998 (No./1,000)	1999 (No./1,000)	2000 (No./1,000)	2001 (No./1,000)	2002 (No./1,000)
NWT study area <sup>1</sup>	67	131	145	104	126	135
Gwich'in Total	91	204	202	184	137	293
Inuvik	114	209	199	162	124	313

NOTES:  
 1 Includes all of the communities in the ISR, GSA, SSA and DCR  
 2 Tsiigehtchic is policed from Fort McPherson  
 Rates per 1,000 population, aged 10 to 19 years

SOURCE: RCMP G Division (2002), RCMP local detachments (2002, 2004)

Table 4-12 shows that violent crime and property crime rates fell in Inuvik between 1997 and 2000. Because there is no RCMP detachment in Tsiigehtchic, there are no crime rates available for this community.

**Table 4-12: Violent Crimes and Property Crimes in the Gwich'in Communities**

Location	Violent Crimes <sup>1</sup>				Property Crimes <sup>2</sup>			
	1997 (No./1,000)	1998 (No./1,000)	1999 (No./1,000)	2000 (No./1,000)	1997 (No./1,000)	1998 (No./1,000)	1999 (No./1,000)	2000 (No./1,000)
NWT	54	50	50	47	66	70	58	57
Inuvik	93	93	68	62	102	88	74	75
Fort McPherson	84	99	103	89	110	121	97	89
<b>Tsiigehtchic</b>	-	-	-	-	-	-	-	-
NOTES: – = data not available or too small to be expressed 1 Violent crimes includes homicide, attempted murder, sexual assault, nonsexual assault, other sexual offences, abduction and robbery 2 Property crimes include breaking and entering, theft of motor vehicles, theft over \$5,000, theft of \$5,000 and under, possession of stolen goods and fraud Rates per 1,000 population SOURCE: GNWT Bureau of Statistics (2003c)								

#### 4.5 Social and Protection Facilities and Services

The IRHSSA delivers social services to all Gwich'in communities.

Table 4-13 provides details regarding the staffing and facilities of the Inuvik and Fort McPherson RCMP detachments. Tsiigehtchic is policed by the Fort McPherson detachment.

**Table 4-13: Protection Service Features in the Gwich'in Communities (2001)**

Location	RCMP – Officers and Facilities			Number of Firefighters	Current Emergency Plan
	Number of Officers	Number of Cells	Maximum Capacity of Cells		
Inuvik	12	9	18 in cells + 40 in holding cell	2 C, 24 V	Yes
Fort McPherson	5	6	12 in cells + holding cell	8 V	Yes
<b>Tsiigehtchic</b>	<b>Policed from Fort McPherson</b>	<b>0</b>	<b>0</b>	<b>5 V</b>	<b>Yes</b>
NOTES: C = career V = volunteer SOURCES: GNWT MACA (2002), RCMP G Division personnel (2002)					

Tsiigehtchic has a volunteer firefighting unit and an up-to-date emergency plan.

## 4.6 Education and Training

### 4.6.1 Levels of Education and Training

Table 4-14 shows that between 1994 and 2001, the percentages of the adult population in Tsiigehtchic that had graduated from high school remained unchanged, as was the case in the GSA Aboriginal communities. However, the percentage with some post-secondary education increased in Tsiigehtchic from 28% to 32% during this period, which was less than the 9% increase in the GSA Aboriginal communities.

**Table 4-14: Education Attainment Levels in the Gwich'in Communities**

Location	High School Graduation			Some Post-Secondary Education		
	1994 (%)	1999 (%)	2001 (%)	1994 (%)	1999 (%)	2001 (%)
NWT	65	68	65	44	46	56
GSA total	64	65	64	47	48	54
GSA Aboriginal communities total	41	43	41	26	34	35
Inuvik	72	72	71	54	53	61
Fort McPherson	41	45	41	25	34	36
<b>Tsiigehtchic</b>	<b>40</b>	<b>37</b>	<b>40</b>	<b>28</b>	<b>34</b>	<b>32</b>
NOTE: Percentage of population, aged 15 years and older						
SOURCE: Calculated from GNWT Bureau of Statistics (2003f), Statistics Canada (2003a)						

Table 4-15 shows that gender differences are apparent in educational attainment in the Gwich'in communities in 2001. Contrary to the pattern in the GSA and Northwest Territories Aboriginal communities, more men than women were high school graduates and had some post-secondary education in Tsiigehtchic.

**Table 4-15: Education Attainment by Gender in the Gwich'in Communities (2001)**

Location	Gender	High School Graduate (%)	Some Post-Secondary Trades Training (%)	Some College or University Education (%)	Some Trades Training, College or University (%)
NWT	Males	64	30	26	56
	Females	66	22	34	56
NWT Aboriginal communities total <sup>1</sup>	Males	43	25	11	37
	Females	44	20	18	38
GSA total	Males	62	33	22	55
	Females	65	26	29	55
GSA Aboriginal communities total	Males	39	24	12	36
	Females	42	22	15	37

Table 4-15: Education Attainment by Gender in the Gwich'in Communities (2001) (cont'd)

Location	Gender	High School Graduate (%)	Some Post-Secondary Trades Training (%)	Some College or University Education (%)	Some Trades Training, College or University (%)
Inuvik	Males	70	36	25	61
	Females	72	28	33	61
Fort McPherson	Males	38	19	11	30
	Females	77	40	27	67
<b>Tsiigehtchic</b>	<b>Males</b>	<b>46</b>	<b>46</b>	<b>15</b>	<b>63</b>
	<b>Females</b>	<b>33</b>	<b>17</b>	<b>17</b>	<b>33</b>

NOTES:  
 1 All communities in the Northwest Territories study area except Inuvik, Norman Wells, Fort Simpson, Yellowknife, Hay River and Enterprise  
 Percentages frequently do not sum to 100 for two cumulating reasons: Statistics Canada random rounding of frequencies, and small community populations (see Section 1.7.3, Limitations of Low-Frequency Data)  
 Rates per 1,000 population, aged 15 years and older

SOURCE: GNWT Bureau of Statistics (2001b)

#### 4.6.2 Education and Training Facilities

Table 4-16 shows that by 2004, all Gwich'in communities had schools providing kindergarten to Grade 12 education. The Chief Paul Niditchie School in Tsiigehtchic had 49% unused capacity, and all facilities in the GSA had excess capacity.

Table 4-16: School Profile Data for the Gwich'in Communities

Location	School	Budgeted Full-time Equivalents <sup>1</sup>				Grades Offered <sup>2</sup>	School Capacity <sup>2</sup> (No.)	School Enrollment <sup>2,3</sup> (No.)	Utilization <sup>2</sup> (%)
		Teachers (No.)	Support Staff (No.)	Admin. Staff (No.)	Other Staff (No.)				
Inuvik	Inuvik total	61	12	8	9	K-12	1,276	799	63
	Samuel Hearne	29	–	–	–	7-12	682	361	53
	Sir Alexander Mackenzie	32	–	–	–	K-6	594	438	74
Fort McPherson	Chief Julius	14	3	0	3	K-12	350	220	63
<b>Tsiigehtchic</b>	<b>Chief Paul Niditchie</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>K-12</b>	<b>88</b>	<b>45</b>	<b>51</b>

Table 4-16: School Profile Data for the Gwich'in Communities (cont'd)

Location	School	Budgeted Full-time Equivalents <sup>1</sup>				Grades Offered <sup>2</sup>	School Capacity <sup>2</sup> (No.)	School Enrollment <sup>2,3</sup> (No.)	Utilization <sup>2</sup> (%)
		Teachers (No.)	Support Staff (No.)	Admin. Staff (No.)	Other Staff (No.)				
NOTES: K = kindergarten 1 2002 data 2 April 2004 data 3 Enrollment data is full-time equivalents, e.g., two children attending kindergarten are counted as one full-time student GNWT Education, Culture and Employment (ECE) typically starts planning for new space when a school reaches a capacity of about 85%									
SOURCE: GNWT ECE (2002, 2004)									

The Aurora College campus in Inuvik offers diverse diploma and certificate courses and programs. Adult basic education and career development courses are provided at the community learning centres in Fort McPherson and Tsiigehtchic in response to effective demand. Recently, these courses have helped people obtain jobs in the oil industry. See the EIS, Volume 4, Section 4.2.5.2, Education Facilities (ISR) for further information on available post-secondary courses.



## 5 TRADITIONAL CULTURE

### 5.1 Introduction

In common with all cultures, the Dene culture includes knowledge, skills, disciplines, beliefs and values. Of these, beliefs and values are the most important, because they inform what life is about and how it is to be lived. Knowledge, skills and disciplines make it possible for individuals to act on their beliefs and values, to be themselves and live a culturally determined good life.

Traditional culture is of prime importance to many Aboriginal people because it is their:

- principal source of pride, worth, distinctiveness and identity
- basis for harvesting the benefits of and meeting the challenges of surviving on the land they respect and love
- a way of dealing with prejudice and discrimination sometimes shown by those from other cultures

Indicator data showing adherence to traditional beliefs and values is currently not available for the Gwich'in communities.

Indicators of culture can be seen in people's behaviour. Culture is reflected in activities that are shaped by beliefs and values, activities that make use of traditional knowledge, skills and disciplines. What people do and are able to do thus serve as indicators of their involvement in traditional culture. The following activity-based indicators are used in this section:

- involvement in traditional harvesting
- the amount of country food consumed
- the ability to speak a traditional language

In Volume 4 of the EIS, the section on historical background and political organization provides an overview of:

- the Dene culture
- contact with Euro-Canadians
- the changes induced by these many contacts over time on the Inuvialuit and Dene livelihood and culture

An inevitable result of these contacts is that some monetary income is now a necessity for Aboriginal people. Those who harvest wildlife are now active in a dual monetary and traditional in-kind economy.

Hunting and fishing, and consuming country food are discussed in the context of the dual economy, an important feature throughout most of the GSA. Trapping is discussed because, by Euro-Canadian standards, it is lonely, hard and dangerous work. The trapper must have most of the same lore, skills and disciplines that were essential to the survival of forebearers in the precontact millennia. Language retention is taken as an indicator of cultural retention because appreciation of traditional, deeper, spiritual relationships can best be comprehended in traditional language terms.

The data presented in this section is from published statistical compilations. Additional information will be documented in ongoing traditional knowledge studies.

## 5.2 Participation in Traditional Harvesting

Information on participation in traditional harvesting is available from surveys conducted by three agencies. The GNWT Bureau of Statistics has conducted periodic harvest surveys of Inuvik and other Northwest Territories residents. In connection with their land claims agreements, much more detailed studies have been made of hunting and fishing harvests by the Gwich'in Renewable Resources Board and Inuvialuit Joint Secretariat. The Gwich'in Renewable Resources Board published data from surveys conducted among all Gwich'in harvesters. Similarly, the Inuvialuit Joint Secretariat published harvest data collected from all Inuvialuit harvesters. Some findings from all three of these surveys are presented in this section. The data presented for each community or region can vary from study to study given the different scope and methods used.

The Gwich'in Renewable Resources Board has not provided data on numbers of active harvesters for recent years. Table 5-1 shows the available findings on numbers of active harvesters from the GNWT Bureau of Statistics surveys in 1993, 1998 and 2002. These surveys show that 38% of the adult population in the Gwich'in Aboriginal communities, including both Aboriginal and non-Aboriginal respondents, reported having hunted or fished in 1998. In Tsiigehtchic, 58% of adults were active in hunting or fishing.

**Table 5-1: Adults Who Hunted or Fished in the Gwich'in Communities**

Location	1993 (%)	1998 (%)	2002 (%)
NWT	18	42	41
NWT Aboriginal communities <sup>1</sup>	42	48	51
BDR total	44	49	44
BDR less Inuvik	54	52	54
Inuvik	10	46	34
GSA Aboriginal communities total	32	38	–
Fort McPherson	31	35	–
<b>Tsiigehtchic</b>	<b>35</b>	<b>58</b>	<b>–</b>
NOTES: – = data not available 1 All study area communities in the Northwest Territories, except Inuvik, Norman Wells, Fort Simpson, Yellowknife, Hay River and Enterprise Percentage of population, aged 15 years and older			
SOURCE: GNWT Bureau of Statistics (1994, 1999, 2002a)			

Two sets of survey data provide indicators of the wildlife harvests in the GSA – data from GNWT Bureau of Statistics and from the Gwich'in Renewable Resource Board. The Gwich'in Renewable Resource Board collected more detailed and precise data for 1996 to 2000. The respondents included all the Gwich'in harvesters living in the GSA communities and Aklavik.

Table 5-2 provides this data in somewhat aggregated form. It shows that the Gwich'in obtained a large harvest of wild game and fish in 2000, although the 1996 harvest was substantially greater. In 2000, the caribou kill amounted to 0.65 caribou per person (all ages), only half the 1.3 amount per person for 1996. In 2000, 23 fish were harvested per person compared with 42 in 1996, but 1.4 geese were harvested per person in 2000, compared with 0.6 in 1996, and 0.02 moose were harvested per person in 1996 and 0.03 per person in 2000.

**Table 5-2: Harvest Data for the Gwich'in Communities**

Species	1996					2000				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
<b>Mammals</b>	916	341	304	397	1,958	168	59	647	278	1,152
Whale	0	0	1	0	1	0	0	0	0	0
Caribou – woodland, barren ground	902	334	286	391	1,913	134	53	635	273	1,095
Moose	13	2	14	6	35	34	2	11	5	52
Dahl's sheep	1	0	0	0	1	0	0	0	0	0
Bears – black, brown	0	5	3	0	8	0	4	1	0	4
<b>Mammals, Furbearers</b>	877	1,558	58	1,108	3,601	685	228	16	421	1,350
Fox, wolf	18	3	0	2	23	2	3	0	0	5
Lynx	63	0	0	51	114	21	0	0	11	32

Table 5-2: Harvest Data for the Gwich'in Communities (cont'd)

Species	1996					2000				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
Mink, marten, wolverine, ermine, otter	279	0	0	659	938	139	0	0	234	373
Beaver	15	137	0	1	153	7	72	7	0	86
Muskrat	341	1,308	0	0	1,649	0	5	0	0	5
Hare and rabbit	161	110	58	389	718	516	147	9	176	848
Porcupine	0	0	0	6	6	0	1	0	0	1
<b>Birds</b>	8	1,808	351	102	2,269	116	3,161	304	20	3,601
Grouse, ptarmigan	4	3	11	88	106	116	25	0	20	161
Goose, swan	0	685	117	0	802	0	2,177	170	0	2,347
Duck	4	1120	223	14	1,361	0	959	134	0	1,093
<b>Fish</b>	47	1,623	21,098	38,525	61,293	135	2,147	21,725	15,538	39,545
Char, whitefish, crookedback, grayling, trout, cisco, salmon	2	999	16,186	29,438	46,625	100	1,451	16,373	13,478	31,402
Other fish – walleye, herring, flounder, sucker, jackfish, coney, loche	45	624	4,912	9,087	14,668	35	696	5,352	2,060	8,143
SOURCE: Gwich'in Renewable Resources Board (1998, 2000)										

The data show that compared with 1996 harvests, there were substantially smaller harvests of caribou and fish, and larger harvests of geese in 2000. The likely explanation for the reduced caribou harvest is that the herd was not as accessible in the first two quarters of 2000 as it was in this period of 1996, though there was a larger harvest in the third quarter of 2000.

It may be that the goose harvest in the second quarter of 2000, substantially larger than in the second quarter of 1996, reflects added efforts made to compensate for the much smaller than usual caribou harvest.

Although winter has the lowest level of harvesting activity, it is during this period that the most productive trapping and seal hunting, and much caribou hunting take place. Usher (2000) provides data on the average edible weights of the wildlife species harvested. Using these values, the total edible weight of the harvests and the average annual yield for the decade of 1988 through 1997 were calculated.

Table 5-3 shows the harvested total edible weights and weights per capita of mammals, birds and fish for 1996 and 2000. Applying figures from Usher (2000), these harvests yielded a total of 166,038 kg of edible meat in 1996, about 99 kg per person, and 119,166 kg of edible meat in 2000, about 71 kg per person.

**Table 5-3: Total and per Capita Edible Weights of Wildlife in the Gwich'in Communities**

Species	1996		2000	
	Total (kg)	Total per Capita (kg)	Total (kg)	Total per Capita (kg)
Mammals	77,079 <sup>a</sup>	45.9	51,334 <sup>a</sup>	30.6
Birds	2,206	1.3	5915	3.5
Fish	86,753	51.6	61,917	36.8
Total	166,038	98.8	119,166	70.9
NOTE: a Excludes polar and grizzly bear, which are commonly not eaten				
SOURCE: Gwich'in Renewable Resources Board (1998, 2000)				

A monetary value for the Gwich'in wildlife harvest was calculated based on appropriate weighting of the cost of replacing the edible mammal, bird and fish with store-bought beef, chicken and fish. As the Gwich'in harvest reports do not contain figures for active harvesters, the ISR's weighted monetary value figures were also used for the GSA.

Inuvik prices were used for:

- beef blade roast at \$10.29/kg, adjusted to \$10.50/kg for boneless blade roast
- whole chicken at \$7.19/kg, adjusted to \$11.00/kg for boneless chicken
- haddock fillets at \$10.16/kg, rounded to \$10.00/kg

The Inuvik price index was taken as the base because the monetary prices used for game were Inuvik prices. An adjusted price index for each ISR community was calculated as the price index for each community, relative to the Inuvik price index. This relative index for each community was then weighted by the number of harvesters in that community, and the weighted average of these community-specific adjusted price indices was calculated as follows:

1. The food price index of each community was divided by the Inuvik price index.
2. This quotient for each community was multiplied by the number of hunters in each community.
3. The resulting values for each community were totalled.
4. This total was divided by the total of the harvesters in these communities.

The resulting weighted price index figure for the ISR was then used to weight the Inuvik monetary price of mammals, fowl and fish. Each of these weighted monetary values was multiplied by the usable weight of the ISR total mammals, fowl and fish harvests, resulting in the total ISR monetary value of mammal, fowl and fish harvests. The sum of these three total values is the monetary value of the ISR total harvest.

Table 5-4 shows the wildlife harvest edible weights, multiplied by the regional monetary values, and totalled. The same monetary values per kilogram were used for 1996 and 2000. For the Gwich'in, this procedure yielded total monetary values for the edible wildlife harvests of \$2,073,117 for 1996 and \$1,493,380 for 2000.

**Table 5-4: Monetary Values of Wildlife Harvests by Gwich'in Harvesters**

Species	1996		2000	
	Total Harvest (kg)	Harvest Value (\$)	Total Harvest (kg)	Harvest Value (\$)
Mammals	77,079	985,673	51,334	656,452
Birds	2,206	30,892	5,915	82,849
Fish	86,753	1,056,552	61,917	754,079
Total	166,038	2,073,117	119,166	1,493,380
NOTE: See the text for procedures for deriving monetary values per kilogram for mammals, birds and fish				
SOURCES: Gwich'in Renewable Resources Board (1998, 2000), Usher (2000)				

### 5.3 Consumption of Country Foods

Table 5-5 presents 1993, 1998 and 2002 GNWT survey data showing the percentages of all households, Aboriginal and non-Aboriginal, reporting that more than half of the food they consumed was country food. In 1998, 73% of Tsiigehtchic households and 80% of GSA Aboriginal community households reported that half or more of their diet was country food.

**Table 5-5: Country Food Consumption in the Gwich'in Communities**

Location	Households Where Country Food is Consumed <sup>1</sup>		
	1993 (%)	1998 (%)	2002 (%)
NWT	29	30	33
NWT Aboriginal communities <sup>2</sup>	73	68	70
BDR total	51	51	45
BDR less Inuvik	73	69	63
Inuvik	30	31	29
GSA Aboriginal communities total	76	80	–
Fort McPherson	82	81	–

**Table 5-5: Country Food Consumption in the Gwich'in Communities (cont'd)**

Location	Households Where Country Food is Consumed <sup>1</sup>		
	1993 (%)	1998 (%)	2002 (%)
<b>Tsiigehtchic</b>	<b>46</b>	<b>73</b>	<b>–</b>
NOTES: – = data not available 1 Half or more of food consumed is country food 2 All study area communities in the Northwest Territories, except Inuvik, Norman Wells, Fort Simpson, Yellowknife, Hay River and Enterprise			
SOURCE: GNWT Bureau of Statistics (1994, 1999, 2002a)			

## 5.4 Trapping

Table 5-6 shows that the percentage of trappers aged 25 to 59 years decreased from 68% to 15% between 1987 and 2002 in Tsiigehtchic. In the Gwich'in Aboriginal communities combined, the decline was from 82% to 14% between 1987 and 2002. In no GSA community are there indications of returning to pre-1993 trapping levels.

**Table 5-6: Active Trappers and Average Income in the Gwich'in Communities**

Location	Trappers <sup>1</sup>				Average Annual Income <sup>2</sup>			
	1987 (%)	1993 (%)	1999 (%)	2002 (%)	1987 (\$)	1993 (\$)	1999 (\$)	2002 (\$)
NWT Aboriginal communities <sup>3</sup>	47	18	18	14	2,514	672	919	991
Inuvik	14	4	3	4	1,821	432	729	676
GSA Aboriginal communities total	82	20	15	14	1,819	275	618	667
Fort McPherson	84	19	15	14	1,502	278	672	685
<b>Tsiigehtchic</b>	<b>68</b>	<b>22</b>	<b>18</b>	<b>15</b>	<b>3,856</b>	<b>268</b>	<b>377</b>	<b>583</b>
NOTES: 1 Males, aged 25 to 59 years 2 Income not adjusted for inflation 3 All study area communities in the Northwest Territories, except for Inuvik, Norman Wells, Fort Simpson, Yellowknife, Hay River and Enterprise								
SOURCE: GNWT RWED (1987, 1993, 1999, 2002)								

Although trapper income was over \$3,800 in Tsiigehtchic in 1987, it fell sharply to \$268 in 1993, and since then average earnings per trapper have remained at very low levels.

## 5.5 Aboriginal Language

Table 5-7 shows that between 1989 and 1999, there was a decline from 43% to 31% of Tsiigehtchic residents aged 15 and older who could speak an Aboriginal language. Both of these rates were only about two thirds as high as for all of the Northwest Territories.

**Table 5-7: Aboriginal Language Speakers in the Gwich'in Communities**

<b>Location</b>	<b>1989 (%)</b>	<b>1994 (%)</b>	<b>1999 (%)</b>
Northwest Territories	56	50	45
Inuvik	26	25	25
GSA Aboriginal communities total	33	26	28
Fort McPherson	31	24	27
<b>Tsiigehtchic</b>	<b>43</b>	<b>40</b>	<b>31</b>
NOTE: Percentage of Aboriginal people, aged 15 years and older			
SOURCE: GNWT Bureau of Statistics (2001a)			

## **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

In this section, 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.

## 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, which 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
- 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

Land ownership was chosen as a valued component 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**

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 commercial transportation and agriculture. These might occur near the study area. Directly or indirectly, project activities might affect these commercial activities.

### **6.2.3.9 Environmentally Protected Areas**

The project occurs 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

### **6.2.3.10 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 study area. Installation of the project components, particularly the facilities, has the potential to affect visual and aesthetic values.

## **6.3 Baseline Conditions**

### **6.3.1 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 6-1 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.

### **6.3.2 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 (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.

### **6.3.3 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 the 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 Tsiighehtchic and Fort McPherson sawmills process small amounts of wood (14 to 18 m<sup>3</sup>) for picnic tables and small projects (Lewis 2002, personal communication). These sawmills are used to meet local demands for small construction projects.

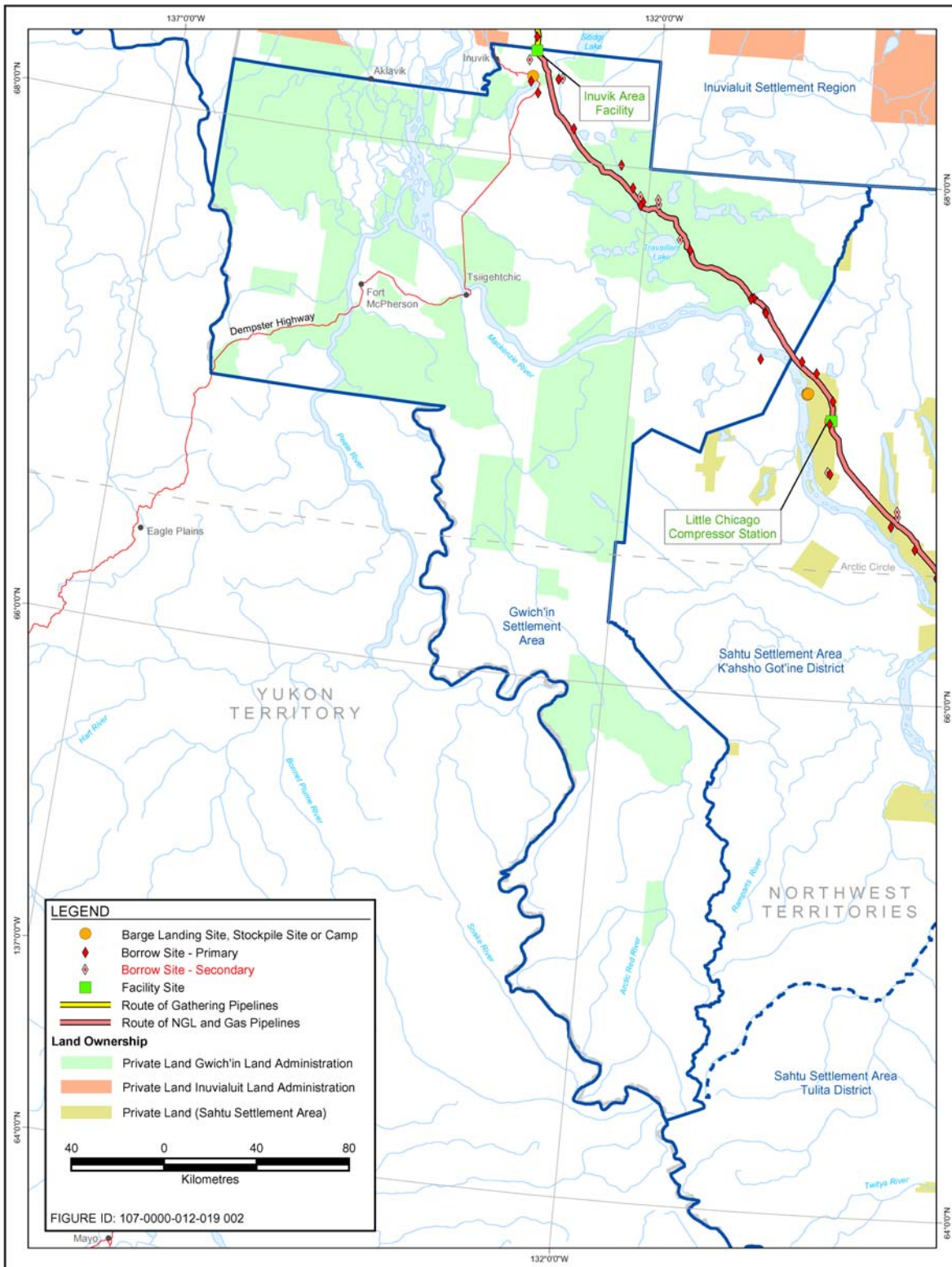


Figure 6-1: Land Ownership – Gwich'in Settlement Area

### 6.3.4 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 Diamondex 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 km<sup>2</sup> in the Anderson River watershed (Diamondex Resources Ltd. 2003). Diamondex Resources Ltd. has plans to conduct extensive diamond exploration in this area.

### 6.3.5 Oil and Gas Activities

Table 6-1 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 planned 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 6-2 shows all current oil and gas dispositions within the GSA.

**Table 6-1: 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	

### 6.3.6 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

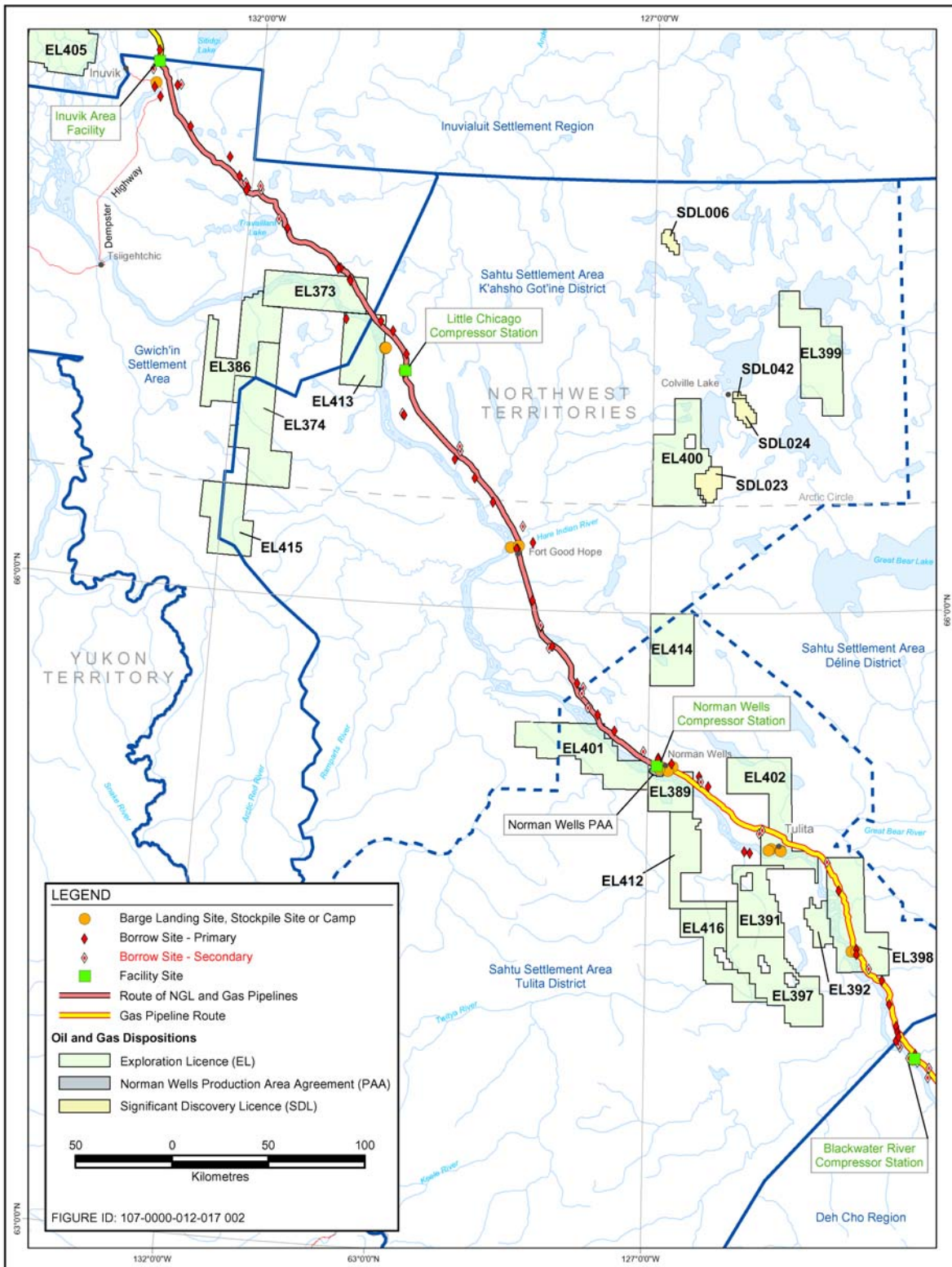


Figure 6-2: Oil and Gas Dispositions – Gwich'in Settlement Area and Sahtu Settlement Area

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 (DFO) in Inuvik, no commercial fishing licences are issued for the GSA part of the study area (Charlie 2002, personal communication). DFO 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 licensed 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

### 6.3.7 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).

### 6.3.8 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.

### 6.3.9 Environmentally Protected Areas

The Gwich'in 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 6-3 shows the special management protected areas within the GSA.

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.

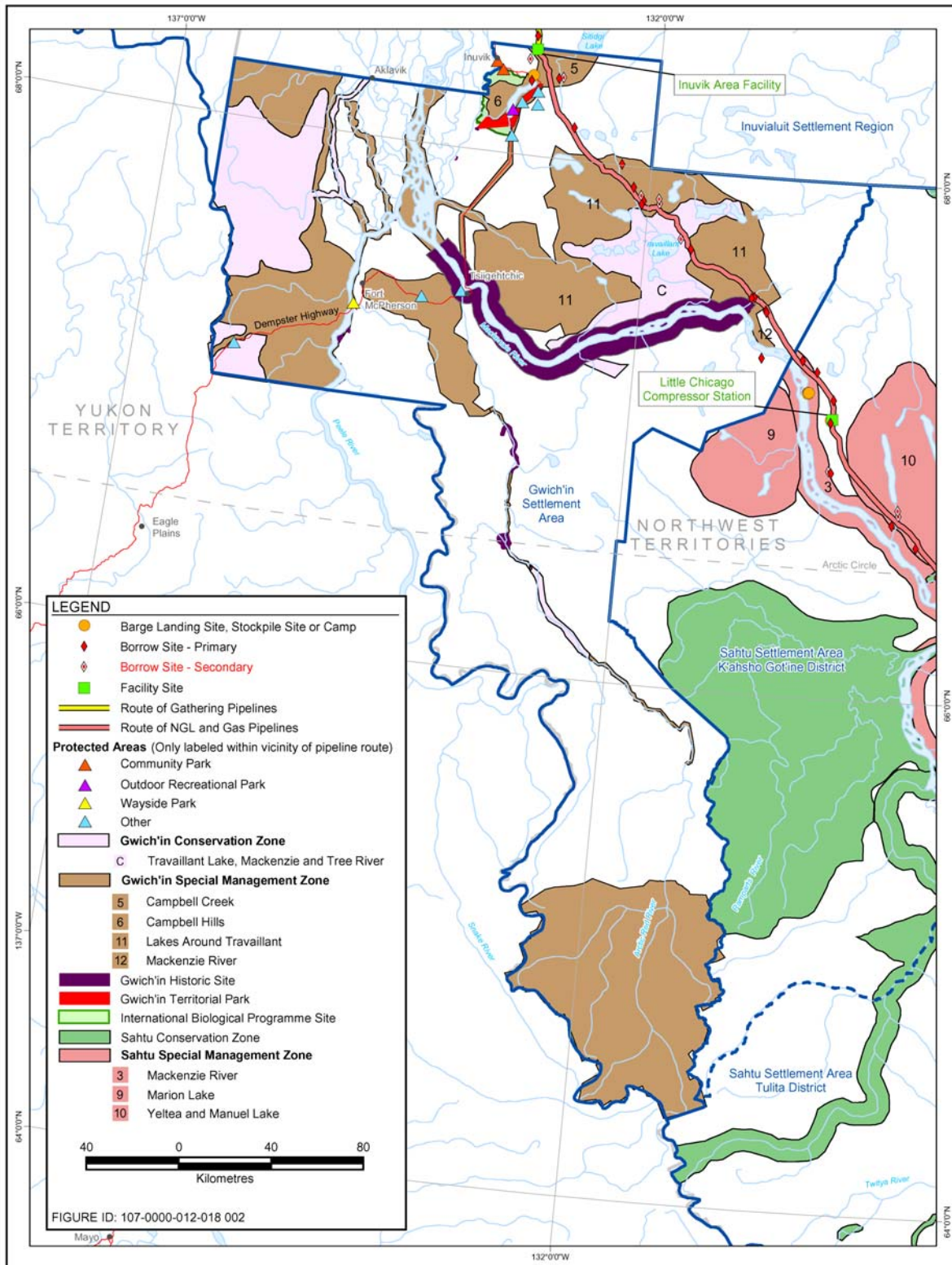


Figure 6-3: Protected Areas – Gwich'in Settlement Area

The pipeline route traverses the proposed Travailant 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 Nagwichoonyik National Historic Site administered by the Gwich'in Tribal Council. The Nagwichoonyik 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. Nagwichoonyik 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.

### 6.3.10 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.



## **7 HERITAGE RESOURCES**

### **7.1 Introduction**

The baseline is discussed under the broad headings of prehistory and history because of the nature of the data. Relatively little specific data is available for the prehistoric context of the community areas of individual settlement regions. Therefore, the information was based, in part, on comparable data previously recorded in areas with similar subsistence strategies. This information applies to broader areas than the more specific historic data.

The cultural backgrounds of the people within the traditional areas are also presented in some detail, as this is a fundamental link for archaeologists as they find and understand the physical remains of cultures.

### **7.2 Overview of the Tsiighehtchic Area**

#### **7.2.1 Prehistory**

The prehistory of the Tsiighehtchic area is adapted from the EIS, Section 7.3.1.2, Gwich'in, Sahtu and Deh Cho Areas Prehistory.

Because of permanent ice cover, this region of the Mackenzie Valley and some of the surrounding lands to the east did not exist, in their present form, until after 9,900 before present (BP). Occupation was not likely before this time. Although the earliest human habitation of the Mackenzie Valley is unknown, it may have been associated with populations moving south from a Beringian refugium. Although there are no very old sites within the Tsiighehtchic area that have been scientifically dated, tools that are similar to those from prehistoric occupations that are dated from 9,000 to 6,000 BP have been recorded. Sites dating up to the Protohistoric Period have been found in the area.

The subsistence pattern of the Tsiighehtchic area is commonly referred to in archaeological literature as a boreal strategy.

More systematic archaeological research has been conducted and more archaeological sites have been recorded in the Mackenzie Valley than in the delta and coastal areas to the north. Therefore, from a prehistoric perspective, considerably more is known about the prehistoric occupation of the Mackenzie Valley. However, many questions remain about specific dates, transition in the complexes and phases that represent the major periods and changes in technology.

Canadian boreal forest prehistory is divided into three major components:

- Early Prehistoric Period (about 11,000 to 7,000 BP)
- Middle Prehistoric Period (about 7,000 to 2,500 BP)
- Late Prehistoric Period (about 2,500 to 250 BP)

These correspond to periods of cultural development marked by changes in weapons, and reflect complex cultural evolutionary processes that include major technological advances. The prehistory of the Mackenzie River Basin, especially in the northern portions, is intermixed with coastal cultural expansions and is less well defined than areas farther south.

### 7.2.2 History and Cultural Context

The history and cultural context of the Tsiigehtchic area are adapted from the EIS, Section 7.4.2, Baseline Conditions – Gwich'in Settlement Area.

The most northerly Athapaskan-speaking people in North America, the Gwich'in, live just south of the Inuvialuit. They have traditionally occupied a large part of the Alaska and Yukon interiors, extending east to the Mackenzie Valley. The Gwich'in who used the land along the Mackenzie River were known as the Nagwichoonjik, the Mackenzie River people (Heine et al. 2001). Summers were spent at fish camps usually located at the mouths of creeks. The Mackenzie River represented an important travel route for the Gwich'in during all seasons, whereas the Mackenzie Delta was well known for summer fishing and spring muskrat harvest.

The caribou was of central importance to the Gwich'in, although other large mammals, such as moose, Dall's sheep, grizzly bear and black bear, were also harvested for food. Small mammals, such as muskrat, beaver, marten, wolf, hare, weasel, wolverine, fox and lynx, among others, were important for subsistence, clothing and intertribal trade (Slobodin 1981a). Much day-to-day subsistence depended on fishing with spears, weirs, fish traps and nets. Migratory birds were also consumed.

Tools included long bows, plus a wide range of stone and bone axes, chisels, mauls, knives, awls, scrapers and fleshers. Copper was acquired through trade with people of the Pacific Coast (Slobodin 1981a). Snowshoes, birchbark canoes and moose skin boats were used for hunting and travelling (Heine et al. 2001, McClellan and Denniston 1981). Sleighs were made of mooseleg skins (Heine et al. 2001). Later, pack dogs and dog teams improved the ability for long-distance travel.

The Gwich'in did not have permanent settlements until after contact with Europeans, but tended to revisit distinct areas over the years, such as caribou hunting or fishing locales. Dwellings included (Heine et al. 2001, Pilon 2002):

- moss and sod structures
- semi-subterranean framed structures
- caribou skin tents
- willow lean-tos
- snow houses

A synopsis of the historic past is an important aspect of the baseline setting, as archaeologists are also responsible for recording Historic Period remains. Perhaps as early as the mid-eighteenth century, the Slavey of the Mackenzie Valley were introduced, by Cree or Chipewyan middlemen, to a few European trade items, such as knives and hatchets. Inuvialuit traded to the west and south with the Alaskan Inuit for Russian goods. Initial contact with Europeans occurred with Alexander Mackenzie's expedition in 1789. Although Mackenzie's expedition reached Inuvialuit territory, the first contact with the Inuvialuit occurred with the Franklin Expedition in 1826.

The first trading post in Slavey territory was Livingston's Fort, established by the North West Company about 1796, on the Mackenzie River downstream of Great Slave Lake (Asch 1981). With the North West Company fur trade posts on the Mackenzie River, the Dene were afforded direct access to Euro-Canadian goods (Innis 1962). Between 1800 and 1810, five short-lived posts were established along the Mackenzie and Liard rivers. By 1879, when Wrigley was established, the posts operating along the lower Mackenzie included Fort Norman (now Tulita), Wrigley, Fort Simpson and Fort Good Hope. The Inuvialuit traded with the Dene at Fort Good Hope. Fort McPherson on the Peel River was also in operation.

By the end of the nineteenth century, Christian missionaries had been in contact with the people in the Mackenzie Valley. Euro-Canadian activities within the Mackenzie Valley encouraged regional concentration of the dispersed populations centred on trading posts and missions (Savishinsky and Hara 1981). These centres drew in people from several ethnic or dialectic groups, making communities more sedentary and redefining their identities in association with specific posts, thus creating bands with which treaties could be signed.

The Canadian government did little to assert its presence in Slavey and Hare Territory until its first treaty negotiations at Fort Resolution and Fort Vermilion brought segments of the Slavey into Treaty 8 in 1900. The Fort Nelson Slavey were added to Treaty 8 in 1911. Under the advisement of Bishop Breynat, the Gwich'in signed Treaty 11 in July 1921 (Heine et al. 2001). A treaty with the Gwich'in, the rest of the Slavey and the Hare was not signed until 1921 (1922 in Fort Liard) (Asch 1981). The terms of this treaty are still in dispute.

Competition between companies, followed by mergers, resulted in fur trade posts being closed and new ones being opened. However, by the 1930s, exploitation of mineral resources replaced the fur trade as the principal industry of the Northwest

Territories. The World War II period was pivotal in this, with development of the oil reserves at Norman Wells and construction of the Canol pipeline. With these industrial developments, the Dene found temporary and permanent wage employment, further concentrating populations in established communities.

Through the first half of the twentieth century, the Dene life changed only gradually because of the influx of Euro-Canadian goods and influences. Subsistence still depended on traditional pursuits, self-reliance and mobility (Asch 1981). During the early and middle portion of the century, the high price of furs persuaded many Slavey to become seriously involved in trapping and in the market economy of the dominant culture. Coupled with an increasing reliance on government services, this has resulted in a more sedentary existence. With the recent collapse in the fur market, the supplementary income formerly provided by trapping has had to be replaced with wage work, where available (see Section 4, People and the Economy).

The Métis are the descendants of non-Aboriginal and Aboriginal parents, usually with Dene maternal and Euro-Canadian paternal ancestries. Since about 1850, the Métis have participated in traditional subsistence activities, working as interpreters, trappers and provisioners, and at trading posts. The Métis were most recognized for their role in transporting goods via canoe, York boat and steamboat (Slobodin 1981b). Today, the Métis live throughout the Mackenzie region, although they have a collective identity based on a shared heritage.

The discovery of oil at Norman Wells in 1920 provided the impetus for treaty negotiations between the Gwich'in and the Canadian government. As mentioned previously, the Gwich'in signed Treaty 11 in July 1921. Treaty 11 was designed to remove Gwich'in title to the land in return for obligations of cash and annuities, and hunting, trapping and fishing equipment. The Gwich'in interpreted this treaty as a friendship treaty, and expected protection of their traditional lifestyles and lands (Heine et al. 2001). Large-scale oil exploration in the Mackenzie region in the 1970s provided an opportunity for political organization of the Gwich'in under the position of Aboriginal rights to the land. This position culminated in signing of the Gwich'in Comprehensive Land Claim Agreement in 1992.

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## GLOSSARY

<b>Aboriginal</b>	Any Indian, Inuit or Métis person who was born in the Northwest Territories or who is descended from an Aboriginal person born in the Northwest Territories.
<b>abandonment</b>	The act of permanently stopping operations, discontinuing service, removing facilities and restoring land to a productive state.
<b>Aboriginal community</b>	A community in which the majority of residents are Aboriginal.
<b>anchor field</b>	The three natural-gas fields, Taglu, Parsons Lake and Niglintgak, whose production will provide the initial volume of gas shipped in the Mackenzie Valley Pipeline.
<b>archaeological site</b>	A site where an archaeological artifact is found.
<b>artifact</b>	Any tangible evidence of human activity that is more than 50 years old, in respect of which an unbroken chain of possession cannot be demonstrated.
<b>baseline conditions</b>	Existing conditions in the communities and ethnic regions of the area before any project effects are experienced.
<b>baseline information</b>	The current state of the environment or environmental setting for a particular element. This information will help to determine potential environmental effects of a project by providing an environmental reference point for the element, with which to compare future environmental conditions and potential project effects.
<b>BDR</b>	The abbreviation for Beaufort Delta Region.
<b>biophysical environment</b>	The components of the earth including: <ul style="list-style-type: none"><li>• land, water and air, including all layers of the atmosphere</li><li>• all organic and inorganic matter and living organisms</li><li>• the interacting natural systems that include components referred to in the previous bullets</li></ul>

<b>borrow site</b>	An area that could be excavated to provide material, such as gravel or sand, to be used as fill elsewhere.
<b>BP</b>	The abbreviation for before present.
<b>CARS</b>	The abbreviation for community airport radio station.
<b>CBC</b>	The abbreviation for Canadian Broadcasting Corporation.
<b>Commissioner's lands</b>	Federal lands administered by the territorial government.
<b>compressor station</b>	A facility containing equipment that is used to increase pressure to compress natural gas for transportation.
<b>country food</b>	Food traditionally harvested and eaten by local Aboriginal residents.
<b>critical habitat</b>	The habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species, according to the Species at Risk Act.
<b>DCR</b>	The abbreviation for Deh Cho Region.
<b>decommissioning</b>	The act of taking a processing plant or facility out of service and isolating equipment, to prepare for routine maintenance work, suspending or abandoning.
<b>devolution</b>	Ongoing negotiations between the Government of Canada, the GNWT and the Aboriginal Summit that will transfer the current INAC control over land, water and resources to Aboriginal settlement area governments.
<b>DFO</b>	The abbreviation for Department of Fisheries and Oceans (now Fisheries and Oceans Canada)
<b>DIAND</b>	The abbreviation for Department of Indian Affairs and Northern Development.
<b>DME</b>	The abbreviation for distance measuring equipment.
<b>ECE</b>	The abbreviation for Education, Culture and Employment (GNWT Department).
<b>EIS</b>	The abbreviation for environmental impact statement.
<b>EL</b>	The abbreviation for exploratory licence.

<b>employment rate</b>	Percentage of population, aged 15 years and older employed during the week before the survey.
<b>environmental effect</b>	<p>For a project, any change that the project might cause in the environment, including any change it might cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as defined in the Species at Risk Act. Also, any effect of any project-induced change on:</p> <ul style="list-style-type: none"><li>• health and socio-economic conditions</li><li>• physical and cultural heritage</li><li>• the current use of lands and resources for traditional purposes by aboriginal people</li><li>• any structure, site or thing that is of historical, archaeological, palaeontological or architectural significance</li></ul> <p>Also, any change to the project that might be caused by the environment.</p>
<b>environmentally protected areas</b>	Areas with special designations that, through legislation or other means, are protected in some form or are given special status.
<b>environmentally sensitive area</b>	An area designated in regional or local land use plans, or by a local, regional, provincial or federal government body as being sensitive to disturbance, or identified by an applicant as being sensitive for some reason.
<b>facilities</b>	Structures of the gathering and gas pipeline systems, including compressor and pump stations, block valves, pigging facilities, heater stations and meter stations.
<b>FAS/FAE</b>	The abbreviation for foetal alcohol syndrome/effects.
<b>federal Crown lands</b>	Federal lands administered by INAC (also referred to as territorial lands in the Territorial Lands Act)
<b>five-year mobility status (migration)</b>	The relationship between a person's usual place of residence on May 14, 1996 compared to the previous five years.

<b>FSS</b>	The abbreviation for flight service station.
<b>gas pipeline</b>	The pipeline that transports compressed natural gas from the Inuvik area facility to the southern terminus near the Northwest Territories–Alberta boundary.
<b>gathering pipelines</b>	Four pipelines, also known as laterals, that transport natural gas and NGLs from the anchor fields to the Inuvik area facility. These include the Niglintgak lateral, Taglu lateral, Parsons Lake lateral and Storm Hills lateral.
<b>gathering system</b>	A system of pipelines, compressor stations and other related facilities that gather natural gas and associated NGLs from the anchor fields and transport it to the gas pipeline system located at the Inuvik area facility.
<b>GLUPB</b>	The abbreviation for Gwich'in Land Use Planning Board.
<b>GNWT</b>	The abbreviation for Government of the Northwest Territories.
<b>granular resources</b>	Sand, gravel, clay, quarry materials and silt.
<b>GSA</b>	The abbreviation for Gwich'in Settlement Area.
<b>heavy drinking</b>	Consuming five or more drinks at one sitting.
<b>heritage resources</b>	Locations where events took place in the past, or all of the objects that they contain, including any contextual information that may be associated with them that will aid in their interpretation, including natural specimens and documents or verbal accounts.
<b>heritage resources</b>	Cultural, historic, archaeological and palaeontological resources are collectively known as heritage resources and can include pre-contact and post-contact features.
<b>historic archaeological resources</b>	Sites, artifacts, structures and documents that relate to the influx of Euro-Canadians in the region, and date to the last 250 years.
<b>honey bag</b>	A plastic liner used in non-flush toilets which is removed when full.
<b>HSS</b>	The abbreviation for Health and Social Services (GNWT Department).

<b>human health</b>	A state of complete physical, mental and social well-being, and the ability to adapt to the stresses of daily life. It is not merely the absence of disease or infirmity.
<b>human health assessment</b>	Considers the effect of hazardous substances, environmental factors and exposure conditions on local and regional populations. It might consist of qualitative and quantitative assessments.
<b>ICD-9 code</b>	The abbreviation for International Classification of Diseases, Version 9.
<b>ILS</b>	The abbreviation for instrument landing system.
<b>INAC</b>	The abbreviation for Indian and Northern Affairs Canada (Government of Canada).
<b>infrastructure</b>	Basic facilities, such as transportation, communications, power supplies and buildings, which enable an organization, project or community to function.
<b>Inuvik area facility</b>	The gas and NGL processing facility for the Mackenzie Gas Project to be located near Inuvik.
<b>IRHSSA</b>	The abbreviation for Inuvialuit Regional Health and Social Service Authority.
<b>ISR</b>	The abbreviation for Inuvialuit Settlement Region.
<b>JRP</b>	The abbreviation for Joint Review Panel.
<b>lateral</b>	A pipe that branches away from the central and primary part of the system.
<b>limiting factor</b>	Anything that has a measurable controlling effect on a species' growth or expansion, or on a biophysical element's continued capability to support its ecosystem.
<b>local study area</b>	A 1-km-wide buffer or corridor around each of the three lease areas, gathering system right-of-way, facility infrastructure sites, pipeline right-of-way and borrow sites.
<b>LSA</b>	The abbreviation for local study area.
<b>MACA</b>	The abbreviation for Municipal and Community Affairs

<b>major repairs (housing)</b>	Refers to such conditions as defective plumbing or electrical wiring, or structural repairs to walls, floors or ceilings.
<b>Métis</b>	A person with a mixture of Aboriginal and non-Aboriginal ancestry.
<b>migrants</b>	Individuals moving to a different community.
<b>migratory bird</b>	Any migratory bird as referred to in the Migratory Birds Convention Act, including the sperm, eggs, embryos, tissue cultures and parts of the bird.
<b>minor repairs (housing)</b>	Refers to such conditions as missing or loose floor tiles, brick or shingles, or to defective steps, railing or siding.
<b>mitigation</b>	The elimination, reduction, or control of a project's adverse environmental effects, including restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or other means.
<b>monitoring</b>	Resolving specific outstanding environmental issues, observing the potential environmental effects of a project, assessing the effectiveness of mitigation measures undertaken, identifying unexpected environmental issues and determining the action required based on the result of these activities.
<b>municipal lands</b>	Lands administered by the territorial government or the municipality.
<b>N/A</b>	The abbreviation for not applicable.
<b>NDB</b>	The abbreviation for nondirectional beacon.
<b>NGL</b>	The abbreviation for natural gas liquid.
<b>NGL pipeline</b>	The pipeline connecting the Inuvik area facility with the Enbridge Pipeline facilities at Norman Wells.
<b>NGO</b>	The abbreviation for nongovernmental organization.
<b>NGTL</b>	The abbreviation for NOVA Gas Transmission Limited.

<b>NGTL interconnect facility</b>	The southernmost point of the gas pipeline where it connects either directly with the natural gas pipeline system in northwestern Alberta or to a third-party extension that subsequently connects to the existing system.
<b>Niglintgak</b>	The anchor field to be developed by Shell. The field includes three well pads, one gas conditioning facility, flow lines and supporting infrastructure. The gas conditioning facility might be barge or land based.
<b>Niglintgak lateral</b>	The gathering pipeline connecting the Niglintgak gas conditioning facility to a connection point on the Taglu lateral at the outlet of the Taglu gas conditioning facility.
<b>nonrenewable resources</b>	Resources, such as fossil fuels (oil, gas, coal) and minerals that occur naturally but cannot be replaced once exploited.
<b>nonresident</b>	An individual who resides outside the Northwest Territories.
<b>nontraditional land use</b>	Existing land and resource uses for nontraditional users, including residents and nonresidents within the study area.
<b>nontraditional resource harvesting</b>	Includes hunting, fishing and trapping pursued by non-Aboriginal residents. May be for domestic, sport or commercial purposes.
<b>NWT</b>	The abbreviation for Northwest Territories.
<b>Operations Phase</b>	The phase of a project during which the pipeline and associated facilities are operated.
<b>palaeontological sites</b>	Sites bearing evidence of multi-cellular invertebrate, vertebrate faunal remains and plant materials that have been fossilized or otherwise preserved.
<b>Parsons Lake</b>	The anchor field to be developed by ConocoPhillips and ExxonMobil. Initially, the field will consist of a north pad for the well sites and gas conditioning facility. A second well pad will be developed five to 10 years after the north pad.
<b>Parsons Lake lateral</b>	The gathering pipeline connecting the Parsons Lake gas conditioning facility to a connection point at the Storm Hills pigging facility.

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<b>participation rate</b>	Percentage of population, aged 15 years and older in the labour force.
<b>physical infrastructure</b>	All of the physical facilities, roads, barge landings, airstrips and other infrastructure that may require maintenance or repair, or which may have a shortened lifespan as a result of project-related activities.
<b>pipeline</b>	A line used for transmitting oil, gas or any other commodity and that connects a province with any other province or provinces or extends beyond the limits of a province or the offshore area as defined in section 123 of the National Energy Board Act.
<b>pipeline corridor</b>	The 1 km-wide area that generally centres on the combined right-of-way for the NGL and gas pipelines, from the Inuvik area facility to the southern terminus.
<b>potential labour supply</b>	People of working age who are unemployed and those not participating in the labour force who do want a job, less those who, because of disability, age, illiteracy, or lack of education, skills or training could be considered unemployable, according to the GNWT Bureau of Statistics definition.
<b>prehistoric archaeological resources</b>	Archaeological sites, objects and affiliated materials that represent occupation by Aboriginal peoples before the arrival of European goods, people and the historic records that characterize their culture (in North America).
<b>private lands</b>	Lands administered by the land administration within the settlement region.
<b>production area</b>	The area that encompasses all project components located north of the Inuvik area facility, including Niglintgak, Taglu and Parsons Lake, the gathering pipelines, facilities, infrastructure, and the 1 km-wide area surrounding each of these project components.
<b>project proponents</b>	The five organizations (Imperial, the APG, ConocoPhillips, Shell and ExxonMobil) that are undertaking the Mackenzie Gas Project.
<b>project, the</b>	The abbreviation for the Mackenzie Gas Project.

<b>project-specific effect</b>	An effect caused by the project. Such effects are sometimes referred to as direct effects as they only include the project's contribution to the effect (as opposed to cumulative effects, in which case other projects would contribute to the effect).
<b>property crime</b>	Breaking and entering, theft of motor vehicles, theft over \$5,000, theft \$5,000 and under, possession of stolen goods, and fraud.
<b>provincial Crown lands</b>	Lands administered by the Alberta Public Lands Administration.
<b>RCMP</b>	The abbreviation for Royal Canadian Mounted Police.
<b>reclamation</b>	The process of re-establishing a disturbed site to a former or other productive use, not necessarily to the same condition that existed before disturbance. The land capability might be at a level different, i.e., lower or higher, than that which existed prior to the disturbance, depending on the goal of the process. Reclamation includes the management of a contaminated site and revegetation where necessary. Reclamation is not considered complete until the goals for reclamation have been achieved.
<b>recovery strategy</b>	A strategy for the recovery of a listed extirpated, endangered or threatened species prepared by the competent minister (as defined under the Species at Risk Act). If the recovery of the listed species is feasible, the recovery strategy must address the threats to the survival of the species identified by the Committee for the Status of Endangered Wildlife in Canada, including any loss of habitat. The recovery strategy and any amendments will be included in the public registry established under the Species at Risk Act.
<b>regional study area</b>	A 15-km-wide buffer around the three anchor fields, on either side of the gathering system right-of-way and on either side of the pipeline right-of-way.
<b>regular maintenance (housing)</b>	Refers to such conditions as requiring painting or furnace cleaning.
<b>resident</b>	A Canadian citizen or landed immigrant who has been living in the Northwest Territories for at least two years.

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<b>residual effects</b>	Environmental or socio-economic effects that remain after mitigation. Effects that are present after mitigation is applied.
<b>right-of-way</b>	The strip of land a company has acquired, for which it has obtained the rights to construct and operate a pipeline.
<b>RSA</b>	The abbreviation for regional study area.
<b>RWED</b>	The abbreviation for Resources, Wildlife and Economic Development (GNWT Department).
<b>scrip</b>	A document given by the Government of Canada to Métis who applied, promising either land or money, usually 140 acres or \$140, but increased to 240 acres or \$240 after 1885.
<b>SEIA</b>	The abbreviation for socio-economic impact assessment.
<b>social infrastructure</b>	Health, social wellness and education services that may require enhancement or expansion as a result of project-related activities.
<b>socio-economic effect</b>	For a project, any effect on a social or economic element, including direct effects as well as effects resulting from a change in the environment.
<b>species at risk</b>	An extirpated, endangered or threatened species or a species of special concern, as defined in the Species at Risk Act.
<b>species of special status</b>	Species listed under provincial jurisdiction or of recognized local importance because they are vulnerable, threatened, endangered or extirpated.
<b>SSA</b>	The abbreviation for Sahtu Settlement Area.
<b>STI</b>	The abbreviation for sexually transmitted infection.
<b>Storm Hills lateral</b>	The gathering pipeline connecting the Storm Hills pigging facility to a connection point at the inlet of the Inuvik area facility.
<b>study area</b>	The area within the spatial boundaries of the scope of the environmental and socio-economic effects assessment.

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<b>subsistence harvest</b>	The minimum harvest necessary to provide food to support families living within the communities.
<b>Taglu</b>	The anchor field to be developed by Imperial Oil Resources Limited. It consists of one site, which will include the drill sites, gas conditioning facility, flow lines and supporting infrastructure.
<b>Taglu lateral</b>	The gathering pipeline connecting the Taglu gas conditioning facility to a connection point at the Storm Hills pigging facility.
<b>unemployment rate</b>	Percentage of the labour force that was unemployed during the week before the survey.
<b>valued component</b>	Characteristic or features that represent important environmental or socio-economic conditions identified by assessment specialists, communities or stakeholders.
<b>violent crimes</b>	Homicide, attempted murder, sexual assault, nonsexual assault, other sexual offences, abduction and robbery.
<b>visual resources</b>	Land, water, vegetation, animals and structures that are visible on the land.
<b>waterbody</b>	A body of water up to the high-water mark, including canals, reservoirs, oceans and wetlands, but not including sewage or waste treatment lagoons.
<b>well-being</b>	Everything that affects the experience of life, except physical and mental health, including the circumstances of physical existence, the quality of relationships and the threat of violence and crime.
<b>wellness</b>	Includes physical, emotional and mental health, and relationship well-being.

