

ENVIRONMENTAL IMPACT STATEMENT
for the
MACKENZIE GAS PROJECT

Volume 4: Part B

Socio-Economic Baseline

**High Level
Community Report**

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1 INTRODUCTION

1.1 Background and Purpose

The purpose of this report on High Level 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 and in the document entitled, *EIS Supplemental Information: Northwestern Alberta*. 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.

The Mackenzie Gas Project includes development of three onshore natural gas fields (anchor fields) in the Mackenzie Delta, Northwest Territories, and construction and operation of pipelines to transport natural gas and natural gas liquids (NGLs) to market. The Mackenzie Gas Project will terminate just south of the Northwest Territories–Alberta boundary and is regulated by the National Energy Board (NEB). In Alberta, NOVA Gas Transmission Ltd. (NGTL) will extend and expand its NGTL pipeline system between the terminus of the Mackenzie Gas Project and the existing NGTL Thunder Creek compressor station. For this report, the NGTL activities are referred to as the NGTL ancillary project or the NGTL project. The NGTL facilities are regulated by the Alberta Energy Utilities Board.

For this report, the term *project* refers to the Mackenzie Gas Project and does not include NGTL activities. The term *projects* refers to both the Mackenzie Gas Project and the NGTL ancillary project. The term *project proponents* refers to the companies undertaking the Mackenzie Gas Project.

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 which 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, the existing Volumes 4 and 6 of the EIS, and the document entitled *EIS Supplemental Information: Northwestern Alberta*, 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

Topic	EIS, Volume 4	Volume 4B	EIS, Volumes 6A and 6B	Volume 6C	Supplemental Information: Northwestern Alberta
Introduction	1.0	1.0	1.0	1.0	1
Geographic Area of Interest	–	–	–	2.0	–
Public Participation	–	–	–	3.0	12
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	11
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			

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

Topic	EIS, Volume 4	Volume 4B	EIS, Volumes 6A and 6B	Volume 6C	Supplemental Information: Northwestern Alberta
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	11
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	–
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	–

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

Topic	EIS, Volume 4	Volume 4B	EIS, Volumes 6A and 6B	Volume 6C	Supplemental Information: Northwestern Alberta
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	11
Heritage Resources	7.0	7.0	8.0	9.0	–
Cumulative Effects	–	–	9.0	–	13
Monitoring and Follow-Up	–	–	10.0	10.0	–
References, Glossary	end	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, 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.

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.

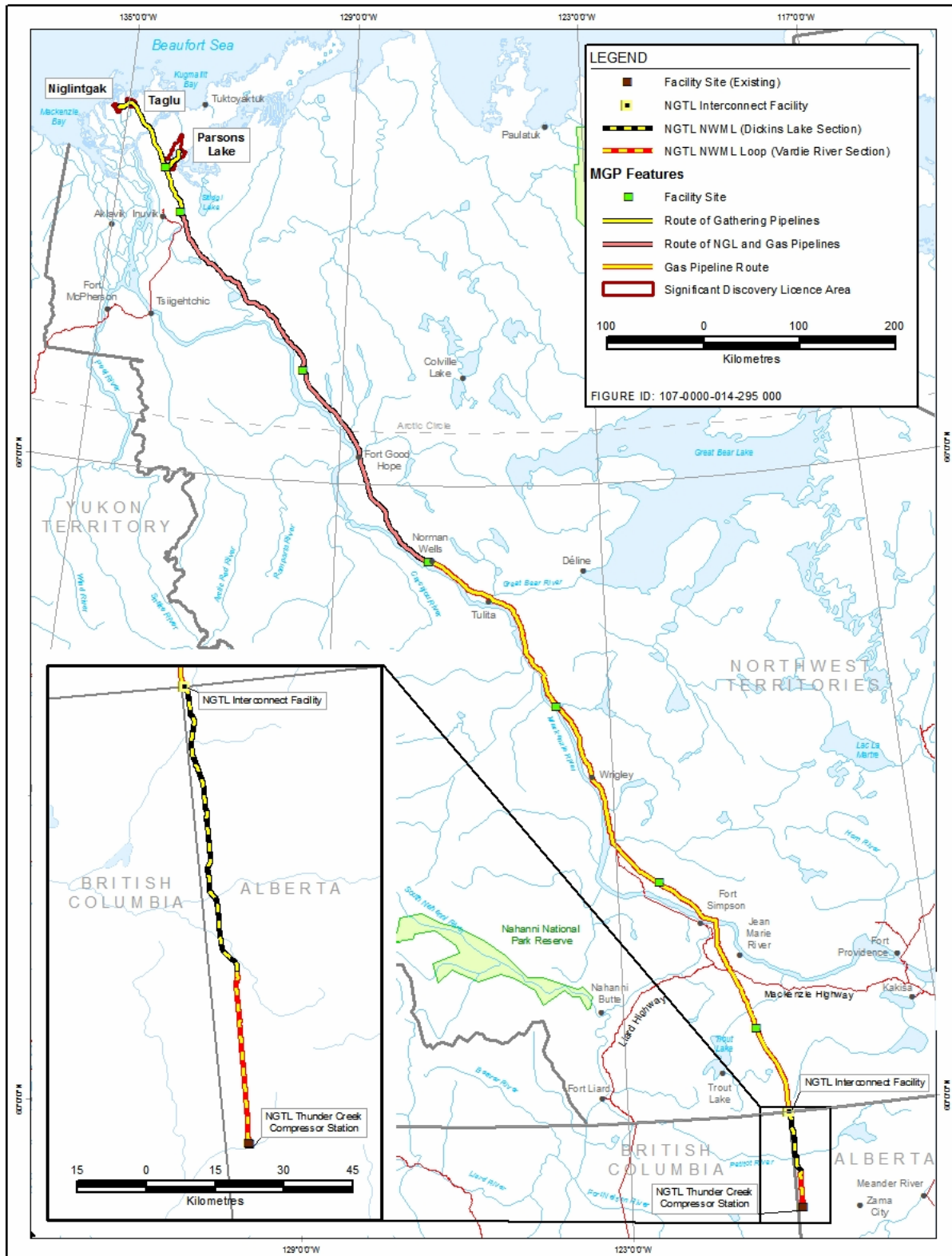


Figure 1-1: Study Area Communities

1.4 Summary of the Socio-Economic Baseline for High Level

High Level, the largest community in the northwestern Alberta part of the study area, is a main highway stopover point as well as an air service hub. With a population of 3,650 persons, this community is predominantly Euro-Canadian. A Mayor and Council govern High Level, and municipal services are supported through tax revenues.

Trades and transport, and equipment operation are the dominant occupations for men in the community. In 2001, High Level had a labour force participation rate of 84% and an employment rate of 82%. In spite of its northern location, the cost of living in High Level is roughly comparable to that in Edmonton.

High Level is generally similar, in terms of utilities, quality of housing and recreation facilities, with most Canadian communities of comparable size. The regional social and health service administration centres, and the physicians and hospital serving the region, are located in High Level, ensuring ready access by residents to the services provided. Sexually transmitted infection and tuberculosis rates are unusually high in Health Region (HR) 17, while the area has lower death rates than anywhere else in the province because of the youthful population. Alcohol abuse and its associated effects, including foetal alcohol syndrome, sexual abuse and sexually transmitted infections, are relatively high in the region. The protection services and social services respond frequently to alcohol-related problems.

High school attainment levels are well below those for the region, but post-secondary levels are the highest in the northwestern Alberta industrial and commercial communities (ICCs), and comparable with the provincial rate. The Fort Vermillion School Division operates three schools that provide kindergarten to Grade 12 instruction, and Fairview College offers some post-secondary education.

Indicators of culture, such as traditional harvesting, country food consumption and ability to speak a traditional language, are unavailable for High Level, as no relevant studies have been conducted.

1.5 Approach

This SEIA is designed to focus on how the projects 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 benefits from the projects, and be vulnerable to adverse effects.

The effects assessment is focused on addressing community concerns, with the aim of designing and implementing the projects 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 administrative data and 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 High Level and the other industrial and commercial centres in northwestern Alberta.

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.

Creating a comprehensive yet readable document entailed synthesizing and analyzing this tabular data, whenever available, to describe the baseline conditions succinctly, and eventually predict and monitor project effects.

In this document, tabular information for High Level 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 High Level.

Three cultural indicators, based on people's activities, are currently available for the ICCs, including High Level:

- 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 ICCs. The focus is on the land or resource uses that the projects 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 ICCs 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 northwestern Alberta ICCs, to:

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

1.6.3 Information Collection and Verification

Collecting data for this volume involved:

- collecting quantitative and qualitative data
- verifying data in the community

Quantitative data was obtained from:

- 1996 and 2001 censuses of Canada
- special surveys conducted by the Government of Canada and Government of the Northwest Territories (GNWT)
- GNWT Health and Social Services (HSS)
- Royal Canadian Mounted Police (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 projects. 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 Mackenzie Gas Project information
- gather community feedback on the Mackenzie Gas 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 or in *EIS Supplemental Information: Northwestern Alberta*. Many of the communities in northwestern Alberta and 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.

Currently, predictions of the effects of the projects on northwestern Alberta residents are constrained because the requisite information is incomplete or lacking. Projecting the effects of development depends first on having a reasonably complete and accurate description of baseline conditions in the region or communities that might benefit or suffer from the effects of project activity. The available information on northwestern Alberta (see the EIS, Volume 4, Socio-Economic Baseline) is incomplete because the DTFN limited its participation to providing certain statistics and administrative data, pending a broader project agreement with the project proponents. Therefore, necessary public and key informant participation in the EIS was not possible. This limits the SEIA findings.

Given the broad similarities between the situations of the people in northwestern Alberta and some of the Deh Cho communities in the Northwest Territories, broad generalizations about expected residual effects of the projects can be made. These generalizations are based on:

- what is now known about the people in the affected communities
- ways in which the pipeline and associated facilities will probably be built
- the health and social services available in northwestern Alberta

These are included in the various relevant key question discussions.

Adequate data was obtained in the predominantly non-Aboriginal service centres of High Level, Rainbow Lake and Zama City. The assessed effects apply only to construction. Most employment numbers and opportunities generated by the projects will end once design and construction, associated cleanup, and site reclamation activities are complete. Few people in this region are likely to obtain employment on the projects during operations. The operations of NGTL facilities will be integrated into existing NGTL programs in the region. Accordingly, there will be no significant socio-economic effects induced by NGTL project operations in northwestern Alberta.

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 includes 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 Aboriginal communities 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 essentially 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 does not apply to High Level where the population is large enough to provide a reasonable statistical base.

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, Rainbow Lake, Zama City and the DTFN communities of Chateh, Meander River and Bushe River all have small populations. As a result, public agencies sometimes pool data for Rainbow Lake and Zama City, and sometimes for all five communities, reporting data only for the combined Census Division (CD) 17. Health data for northern Alberta communities is commonly reported only for all of the Rainbow Health Region.

2 PEOPLE AND THE ECONOMY

2.1 Introduction

This section describes the people of High Level and their economy, including:

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

2.2 Population Composition and Dynamics

There are three predominantly non-Aboriginal communities in the northwestern Alberta part of the study area:

- High Level, the regional service hub for this area
- Rainbow Lake
- Zama City

Both Rainbow Lake and Zama City are smaller than High Level. While all three are involved in servicing the northwestern Alberta oil industry, High Level is also important as the main stop-over point on Highway No. 35 between Edmonton and Hay River.

According to town officials, the 2001 census count for High Level, 3,445, was under-enumerated, and the actual population was about 3,650.

Table 2-1 shows the 1991 and the 2001 age and gender distributions of the High Level and Rainbow Lake populations, and the 2001 distributions only for Zama City. High Level increased in size by about 20% between 1991 and 2001. The majority of High Levels residents 57%, are aged 15 to 44 years, and thus are in the young work force category. In 2001, there were more men than women, 108 for every 100 women, in High Level.

Table 2-1: Census Counts for the Industrial and Commercial Centres in Northwestern Alberta

Location	Age	1991				2001				2001 as % of 1991 Totals (%)
		Male (No.)	Female (No.)	Total (No.)	% of Total (%)	Male (No.)	Female (No.)	Total (No.)	% of Total (%)	
High Level	Total	1,465	1,385	2,850	100	1,785	1,660	3,445	100	121
	0–14	470	485	955	34	505	485	990	29	104
	15–24	240	265	505	18	315	290	605	18	120
	25–44	590	520	1,110	39	680	655	1,335	39	120
	45–64	140	105	245	9	260	200	460	13	188
	65 +	30	15	45	2	30	30	60	2	133
Rainbow Lake	Total	410	410	820	100	545	430	975	100	119
	0–14	120	145	265	32	160	110	270	28	102
	15–24	55	80	135	16	60	55	115	12	85
	25–44	200	160	360	44	230	200	430	44	119
	45–64	35	30	65	8	90	70	160	16	246
	65 +	0	5	5	1	5	5	10	1	200
Zama City	Total	–	–	–	–	80	65	145	100	–
	0–14	–	–	–	–	15	20	36	24	–
	15–24	–	–	–	–	15	10	25	17	–
	25–44	–	–	–	–	35	15	50	34	–
	45–64	–	–	–	–	10	20	30	21	–
	65 +	–	–	–	–	0	0	0	0	–

NOTES:

– = data not available

Totals may not equal the sum of their parts because of random rounding of low-frequency data (see Section 1.7.3, Limitations of Low-Frequency Data)

SOURCE: Statistics Canada (1991, 2001)

The census counts for 2001 in Table 2-2 show that 22% of residents in High Level were of Aboriginal origin.

Table 2-2: Ethnicity for the Industrial and Commercial Centres in Northwestern Alberta (2001)

Ethnic Origin	High Level		Rainbow Lake		Zama City	
	(No.)	(%)	(No.)	(%)	(No.)	(%)
Total Aboriginal and non-Aboriginal population (20% sample) ¹	3,435	100	980	100	130	100
Total Aboriginal origin population	750	22	100	11	10	8
Total non-Aboriginal population	2,685	78	875	89	120	92
North American Indian single origin	250	7	0	0	0	0
North American Indian and non-Aboriginal origins	170	5	50	5	0	0

**Table 2-2: Ethnicity for the Industrial and Commercial Centres in Northwestern Alberta (2001)
(cont'd)**

Ethnic Origin	High Level		Rainbow Lake		Zama City	
	(No.)	(%)	(No.)	(%)	(No.)	(%)
Métis single origin	155	5	40	4	0	0
Métis and non-Aboriginal origins	125	4	10	1	0	0
Other Aboriginal multiple origins	45	1	0	0	0	0
Inuit origin	0	0	0	0	0	0
NOTES: 1 Based on data for a 20% sample of the total population Percentages may not total 100 because of random rounding of low-frequency data (see Section 1.7.3, Limitations of Low-Frequency Data)						
SOURCE: Statistics Canada (2002)						

Statistics on five-year mobility status for 2001 indicate that a large proportion of the High Level population, no less than 71%, moved to a different residence during the previous five years (Statistics Canada 2001).

2.3 Economic Activity

Table 2-3 describes distributions of the High Level, Rainbow Lake and Zama City labour forces by standard occupational groupings for 1991 and 2001. The few small Statistics Canada changes in occupational categories between 1991 and 2001 make little, if any, difference, given the level of aggregation in the table.

Between 1991 and 2001, the representation of males in trades and transport, sciences, and management and business occupations increased, and there were reductions in primary industry, and sales and service occupations. Among females during this decade, there were large increases in management and business, and government service occupations. Employment of women in clerical, and sales and service occupations declined sharply during the decade.

Table 2-3: Labour Force by Standard Occupational Category for the Industrial and Commercial Centres in Northwestern Alberta

Occupation	Gender	High Level		Rainbow Lake		Zama City	
		1991	2001	1991	2001	1991	2001
Labour force, 15+ years	Total (No.)	1,620	2,070	415	610	–	90
	Male (No.)	930	1,135	260	370	–	60
	Female (No.)	690	930	150	240	–	30
All occupations	Total (No.)	1,615	2,060	400	605	–	90
	Male (No.)	925	1,130	260	365	–	60
	Female (No.)	690	930	140	245	–	30

Table 2-3: Labour Force by Standard Occupational Category for the Industrial and Commercial Centres in Northwestern Alberta (cont'd)

Occupation	Gender	High Level		Rainbow Lake		Zama City	
		1991	2001	1991	2001	1991	2001
Management, business, finance and administration occupations	Total (%)	11	18	15	19	–	11
	Male (%)	12	15	12	10	–	17
	Female (%)	9	20	21	35	–	33
Clerical occupations	Total (%)	15	7	4	0	–	0
	Male (%)	3	3	0	0	–	0
	Female (%)	31	12	11	4	–	0
Natural and applied sciences, and related occupations	Total (%)	2	5	5	12	–	0
	Male (%)	4	8	8	21	–	0
	Female (%)	0	2	0	0	–	0
Health occupations	Total (%)	2	4	4	3	–	0
	Male (%)	0	1	0	3	–	0
	Female (%)	6	8	11	6	–	0
Social services, education, government service and religious occupations	Total (%)	7	11	4	7	–	0
	Male (%)	3	4	0	4	–	0
	Female (%)	12	20	11	12	–	0
Art, culture, recreation and sport occupations	Total (%)	1	1	3	0	–	0
	Male (%)	0	1	0	0	–	0
	Female (%)	1	2	7	0	–	0
Sales and service occupations	Total (%)	25	22	10	10	–	17
	Male (%)	17	15	6	4	–	17
	Female (%)	36	31	43	39	–	33
Trades, transport and equipment operators, and related occupations	Total (%)	18	12	13	13	–	22
	Male (%)	29	37	19	23	–	33
	Female (%)	3	2	0	0	–	33
Occupations unique to the primary industry	Total (%)	7	4	21	13	–	22
	Male (%)	9	6	31	15	–	33
	Female (%)	3	2	0	4	–	0
Occupations unique to the processing, manufacturing and utilities industries	Total (%)	12	7	15	12	–	11
	Male (%)	18	12	23	21	–	0
	Female (%)	3	2	0	0	–	0

NOTES:
Number or 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)
Note particularly that since only 60 men and 30 women were reported as having occupations in Zama City in 2001, the occupational distribution percentages, based on randomly rounded data, are only suggestive at best.

SOURCE: Statistics Canada (1991, 2001)

Many High Level residents were also in management and business, sales and service, and social services occupations.

There were changes in the distributions from 1991 to 2001 for High Level, with increases in the percentages employed in management and business, and social service, science, and trades and transport occupations. There was decreased employment in clerical, processing and manufacturing, and primary industry occupations in High Level, and also trades and transport occupations.

2.4 Labour Force

Table 2-4 shows that labour force participation in these communities, driven by the oil industry, has been high. In both 1991 and 2001, the total participation rate was about 85% in High Level, and the employment rates were about 82% in both years. Total unemployment rates were low, 2% in 2001, which is lower than the 1991 rates. The male employment rate in High Level in 2001 was high, 86%, while this rate for women was 77%.

Table 2-4: Participation, Employment and Unemployment Rates for the Industrial and Commercial Centres in Northwestern Alberta

Location	Gender	1991				2001				Difference (2001 minus 1991)		
		Pop. (No.)	Part. (%)	Empl. (%)	Unempl. (%)	Pop. (No.)	Part. (%)	Empl. (%)	Unempl. (%)	Part. (%)	Empl. (%)	Unempl. (%)
High Level	Total	1,915	85	81	4	2,450	84	82	2	-1	1	-2
	Male	1,015	92	87	5	1,280	89	86	3	-3	-1	-2
	Female	905	76	73	3	1,175	79	77	2	3	4	-1
Rainbow Lake	Total	535	77	68	12	710	86	81	5	9	13	-7
	Male	280	93	93	9	380	97	95	3	4	2	-6
	Female	250	60	42	33	325	74	66	10	14	24	-23
Zama City	Total	–	–	–	–	85	93	86	0	–	–	–
	Male	–	–	–	–	45	89	89	0	–	–	–
	Female	–	–	–	–	40	75	75	0	–	–	–

NOTES:

– = data not available, held confidential because of low frequencies to protect individual identities.

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

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)

Number and percentage of population aged 15 years and older

SOURCE: Statistics Canada (1991, 2001)

Table 2-5 shows that the potential labour supply was only about 50 people in High Level in 2001.

Table 2-5: Profile of the Working-Age Population for the Industrial and Commercial Centres in Northwestern Alberta

Profile Category	High Level		Rainbow Lake		Zama City	
	1991	2001	1991	2001	1991	2001
Population 15+ (No.)	1,785	2,150	485	625	–	–
Potential labour supply ¹ (No.)	70	50	50	30	–	–
Potential labour supply ² (%)	4	2	10	5	–	–
NOTES: – = data not available or too small to be expressed 1 Unemployed are presented as indicative of potential labour 2 Percentage of population, aged 15 years and older Data is lacking on persons wanting a job						
SOURCE: Statistics Canada (1991, 2001)						

Table 2-6 shows the 1991 and 2001 distributions for the active labour force by industrial divisions for High Level, Rainbow Lake and Zama City. The significance of High Level as a service centre in 2001 is seen in the work force involvement in government services, 24%, and wholesale and retail trade sectors, 15%.

Table 2-6: Active Labour Force by Industrial Divisions for the Industrial and Commercial Centres in Northwestern Alberta

Occupation	High Level		Rainbow Lake		Zama City ¹
	1991	2001	1991	2001	2001
Total labour force 15+ (No.)	1,620	2,070	415	610	85
Not applicable (No.)	0	10	15	0	10
All industries (No.)	1,620	2,060	400	610	80
Agricultural, fishing and trapping, logging and forestry (%)	6	2	5	0	13
Mining, quarrying and hydrocarbon (%)	6	3	18	27	38
Primary industries – manufacturing (%)	10	15	21	12	0
Primary industries – construction (%)	4	6	3	13	0
Transportation and storage (%)	8	7	0	11	13
Communication and other utilities (%)	2	2	–	–	–
Wholesale and retail trade (%)	17	15	31	6	13
Finance, real estate and insurance agent (%)	5	3	0	2	0
Business services (%)	2	3	0	0	0
Public sector – total government services (%)	22	24	18	16	13

Table 2-6: Active Labour Force by Industrial Divisions for the Industrial and Commercial Centres in Northwestern Alberta (cont'd)

Occupation	High Level		Rainbow Lake		Zama City ¹
	1991	2001	1991	2001	2001
Accommodation, food and beverage services (%)	11	8	0	7	13
Other service industries (%)	6	8	4	3	0
NOTES: – = data not available or held confidential because of low frequencies 1 1991 data for Zama City not available Subtotals may not add up to totals because of variations introduced by random rounding (see Section 1.7.3, Limitations of Low-Frequency Data) Percentage of labour force					
SOURCE: Statistics Canada (1991, 2001)					

2.5 Income Sources and Amounts

No information is currently available on corporate income in any of the northwestern Alberta communities.

Table 2-7 shows that High Level and Rainbow Lake average earned incomes per tax filer in 2000 were higher than that in CD 17. The difference between the 1990 and 2000 figures reflects the relatively high pay scales and heavy work schedules characteristic of employment in the oil and gas sector.

Table 2-7: Employment Incomes for Census Division 17, Industrial and Commercial Centres in Northwestern Alberta

Year	Gender	CD 17 (\$)	Total Communities (\$)	High Level (\$)	Rainbow Lake (\$)	Zama City (\$)
1990	Total	–	26,230	24,951	30,820	–
	Male	–	32,407	29,686	42,131	–
	Female	–	18,212	19,251	14,701	–
2000	Total	27,771	36,244	33,834	44,653	–
	Male	34,626	45,935	41,407	60,765	–
	Female	18,713	23,654	24,234	21,415	–
NOTES: – = data not available, or held confidential because of low frequencies to preserve individual privacy.						
SOURCE: Statistics Canada (1991, 2001)						

The gender-specific data shows that female earned incomes were substantially lower than male incomes. Female 2000 earnings were only 54% of male earnings in CD 17, and only 51% of male earnings in High Level. The 20% increase in female incomes between 1990 and 2000 was exceeded by the 28% increase in male incomes.

Actual income support figures are not supplied in Census Canada data, but Table 2-8 shows the percentage of total income derived from government transfer income support payments. CD 17 income support percentages in 2000 were almost three times the weighted average for High Level, probably reflecting the beneficial impact of the oil and gas sector on the economy of this community. The decline in income support percentages, and the increase in earned income between 1990 and 2000, indicates increased prosperity between 1990 and 2000 in High Level.

Table 2-8: Transfer Income as a Percentage of Total Income for Census Division 17, Industrial and Commercial Centres in Northwestern Alberta

Year	CD 17 (%)	Total Communities (%)	High Level (%)	Rainbow Lake (%)	Zama City (%)
1990	–	5	6	3	–
2000	12	4	5	2	–
NOTES: – = data not available or frequency too small to be expressed					
SOURCE: Statistics Canada (1991, 2001)					

2.6 Cost of Living

Alberta Finance, Statistics conducted a price comparison survey in April 2001 based on pricing 266 to 299 food and non-food items, depending on local availability, in 35 Alberta communities. With Edmonton prices taken as the reference base and assigned a value of 100, the all-commodity index value for High Level was 101, indicating prices were 1% higher than Edmonton prices. The all-food (only) index value for High Level was 106.3, and the all nonfood index value was 99.8 (Alberta Economic Development 2004).

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 of northwestern Alberta. Included are:

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

A discussion of governance is also included in this section.

3.2 Transportation Infrastructure

Table 3-1 shows the transportation infrastructure in High Level, Rainbow Lake and Zama City. High Level serves as the transportation hub for the northwestern Alberta region, and is increasingly important as a stopover for trucks travelling to the Northwest Territories. The importance of this function has been driven by:

- the extensive oil industry activity to the west and north, around Rainbow Lake and Zama City
- its position on the main highway midway between Edmonton and Hay River, which continues on to Yellowknife and Fort Simpson

Table 3-1: Transportation Infrastructure for the Industrial and Commercial Centres in Northwestern Alberta (2003)

Transportation Mode	High Level	Rainbow Lake	Zama City
Road			
Road access	Main access is by Highway No. 35 with alternative access by Highway No. 58 via Highway No. 88, both are all-weather highways	Main access is by Highway No. 58 via Highway No. 35, both are all-weather highways	Main access is by public unpaved, all-weather Zama Road (maintained by Municipal District No. 23) via Highway No. 35
Average daily traffic (number of vehicles)	1,940	810	110
Highway	Highway No. 35 and Highway No. 58	Highway No. 35 and Highway No. 58	Highway No. 35 and Zama Road
Road surface	Paved	Paved	Paved and unpaved

Table 3-1: Transportation Infrastructure for the Industrial and Commercial Centres in Northwestern Alberta (2003) (cont'd)

Transportation Mode	High Level	Rainbow Lake	Zama City
Rail			
Rail access	Yes	No	No
Water			
Marine resupply	No	No	No
Air			
Runway length	1,524 m x 46 m	1,372 m x 31 m	Hamlet of Zama airstrip – 732 m Zama plant airstrip – 1,311 m
Runway surface	Paved	Paved	Paved (plant) and unpaved (hamlet)
Owner	Town of High Level	Town of Rainbow Lake	Maintained by the Municipal District of Mackenzie (hamlet), owned by Apache Corporation (plant)
Critical aircraft	Boeing 737-200	Hercules	Baron 1900, Metro 23
Weather and communication aids	FSS	Provided out of High Level	None
Navigational aids	NDB, VOR, DME	ADF	None
<p>NOTES:</p> <p>– = data not available</p> <p>Air Transportation:</p> <p>ADF = automatic direction finding</p> <p>AWOS = automated weather observation station</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>VOR = VHF omnidirectional range</p>			
SOURCES: Airport managers (2003, personal communication), Town of High Level (2003)			

Table 3-2 lists the distinctive characteristics of the highway traffic near High Level. Figure 3-1 illustrates the geographic relationships. The volume of long-distance tractor-trailer trucking on Highway No. 35 is 14% south of Highway No. 58 and 20% north of Meander River. On every road, the all-year average daily weight of road traffic is heavier than the summer average daily weight, signifying heavier traffic in winter than summer.

Table 3-2: Summer Daily Traffic on Highway No. 35 and Highway No. 58 (2002)

Traffic Check-point	Road	Annual Traffic (No.)	Summer Traffic (No.)	Single-unit Trucks (%)	Tractor-trailer Combinations (%)
1	Highway No. 35 south of Highway No. 58	1,781	1,669	7	14
2	Highway No. 35 between High Level and Meander River	1,200	1,100	5	7
3	Highway No. 35 north of Meander River	450	420	8	20
4	Highway No. 58 east of High Level	230	170	7	2
5	Highway No. 58 west of High Level	715	580	11	11
6	Zama Road	750	680	–	–

NOTE:

The values for Checkpoint 6 were estimated by subtracting the values of Checkpoint 3 from those of Checkpoint 2

SOURCE: Government of Alberta (2004a)

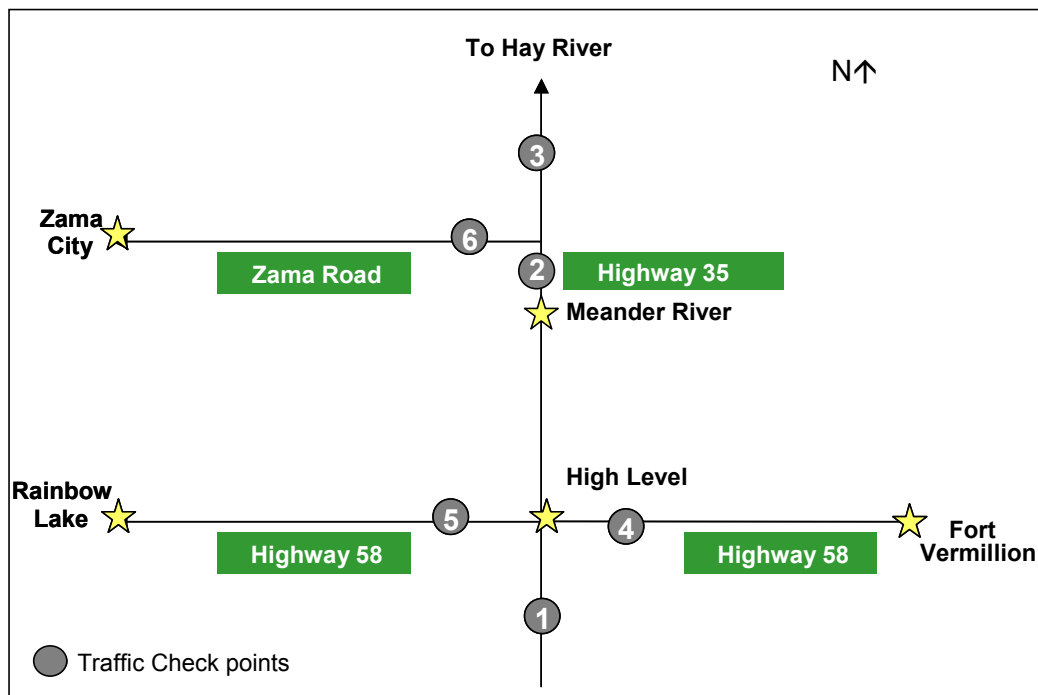


Figure 3-1: Selected Traffic Checkpoints on Highway Nos. 35 and 58

Several scheduled flights connect High Level with Edmonton, Calgary, Peace River, Fort St. John and Fort Nelson. There is also air service between Rainbow Lake and Edmonton. None of the communities has marine resupply capacity.

3.3 Utilities, Energy and Communications

Table 3-3 shows the utilities infrastructure in High Level, Rainbow Lake and Zama City. Water for High Level is sourced from three reservoirs and one storage tank. It is treated using a new \$8 million treatment plant. Modern arrangements exist in all three communities for liquid waste, and High Level and Rainbow Lake share solid waste disposal facilities with Municipal District No. 23. ATCO supplies hydroelectric power.

Table 3-3: Utilities Infrastructure for the Industrial and Commercial Centres in Northwestern Alberta (2004)

Utility	High Level	Rainbow Lake	Zama City
Water			
Delivery system	Piped High Level has three reservoirs and one storage tank	Piped	Piped
Water source	Footner Lake	Surface runoff	Water well south of hamlet
Water treatment	Treatment at a new \$8 million treatment plant by coagulation, filtration and chlorination	Run through a clarifier, chlorinator, and otherwise treated at the town's water treatment plant to generate potable water	Run through a clarifier and chlorinator, and otherwise treated at the hamlet's water treatment plant to generate potable water
Water quality	Run through a clarifier and chlorinator, and otherwise treated at the town's water treatment plant to generate potable water	Good chemical quality for domestic use	Good chemical quality for domestic use
Liquid Waste			
Type of system	Collection through piped system	Collection through piped system	Collection through piped system
Sewage disposal	Sewage treatment provided by four short-term and two long-term lagoons, which are running out of capacity	One long-term and four short-term sewage detention ponds	One lift station and one lagoon
Solid Waste			
Type of disposal	Scheduled pickup system and regional landfill Shared with Rainbow Lake, Municipal District No. 23 and neighbouring bush camps	Scheduled pickup system and regional landfill Shared with Rainbow Lake, Municipal District No. 23 and neighbouring bush camps	Scheduled pickup system from transfer station and regional landfill Shared with High Level, Municipal District No. 23 and neighbouring bush camps
Electric Power			
Installed capacity	Power accessed through power grid	Power accessed through power grid	Power accessed through power grid
Provided by	ATCO	ATCO	ATCO
Peak load requirement	14–15 MW, including industrial loads	2.5 MW, with small remaining capacity	1.5 MW, with medium remaining capacity
Surplus power capacity ¹	-²	-²	-²
Types of heating fuel	Natural gas	Natural gas	Natural gas

Table 3-3: Utilities Infrastructure for the Industrial and Commercial Centres in Northwestern Alberta (2004) (cont'd)

Utility	High Level	Rainbow Lake	Zama City
NOTES: – = data not available 1 No allowance made for reserve power requirements 2 Power supplied by Northwest Territories Power Commission power grid. Spare power capacity cannot be determined.			
SOURCE: Information obtained from service providers or informed users of services (2004)			

Table 3-4 describes the existing communications infrastructure in High Level, Rainbow Lake and Zama City. Despite their somewhat northerly locations, all have the communication facilities and resources typical of most towns and hamlets of comparable size in other parts of Canada.

Table 3-4: Selected Communications Infrastructure for the Industrial and Commercial Centres in Northwestern Alberta (2004)

Communication Type	High Level	Rainbow Lake	Zama City
Cellular telephone	Yes	Yes	Yes, quality varies with location
Radio telephone	–	–	–
Video conference	Yes	Yes	No
Internet	Yes	Yes	Public access at Zama City Library
Transmission of telecommunications	–	–	–
Radio	CBC-AM 740, CISN-FM 103.9 (Edmonton), YL Country (Peace River), and Classic Rock 101 FM (Vancouver)	CBC-AM 740, CISN-FM 103.9 (Edmonton), YL Country (Peace River), and Classic Rock 101 FM (Vancouver)	89.9 FM, rebroadcasting YL Country
Television	Cable	Cable	Satellite (Bell and Star Choice)
Newspaper coverage	High Level Echo, Edmonton Sun, Edmonton Journal	<i>High Level Echo, Edmonton Sun, Edmonton Journal</i> (weekdays)	<i>High Level Echo, Edmonton Sun, Edmonton Journal</i> (weekdays)
Frequency of mail delivery per week	6 times	5 times	Courier 6 days per week brings mail
NOTE: – = data not available			
SOURCE: Information obtained from service providers or informed users of services (2004)			

3.4 Housing and Recreation

Table 3-5 shows that the housing in High Level is generally in good condition, with less than 10% needing major repairs.

Table 3-5: Housing and Repairs Needed for the Industrial and Commercial Centres in Northwestern Alberta (2001)

Location	Total Houses (No.)	Needs Regular Maintenance ¹ (%)	Needs Minor Repairs ² (%)	Needs Major Repairs ³ (%)
High Level	1,165	51	40	9
Rainbow Lake	345	74	20	6
Zama City	170	24	44	32
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 (1991, 2001)				

As elsewhere in the study area, recreation infrastructure varies depending on the size of the community. Larger communities, which cater to substantial transient populations, often have a well-developed recreation infrastructure. This is the case with High Level (Town of High Level 2003), which has:

- an indoor arena with artificial ice
- an indoor swimming pool
- a curling rink with three sheets of artificial ice
- three tennis courts
- six ball diamonds
- three gymnasias

3.5 Governance

High Level is incorporated as a town under the *Alberta Municipal Government Act*. Included in governance are the planning and decision-making organizations, such as community corporations, and town and city councils. The resources made available to these organizations by the Government of Canada, are also included.

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, and this is probably true of some of the many Aboriginal residents in High Level. In the western healing and helping professions, recognizing a holistic approach to wellness has been much more recent.

The influence of this more holistic approach 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

Currently, the most serious addiction in northwestern Alberta is alcohol, which is the most frequent source of wellness problems (Assumption RCMP detachment commanding officer 2004, personal communications; High Level RCMP detachment commanding officer 2004, personal communications).

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.

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 rate for STIs is unusually high in HR 17 which includes High Level, in comparison with the rest of the province. As well, the HR 17 STI rate is increasing more rapidly than in all of Alberta. The social contexts in which these infections are transmitted are often associated with alcohol consumption.

Suicide is a health concern in some regions. In recent years, suicide rates, and particularly male suicide rates, have been higher in HR 17 than in the rest of the province. Suicidal deaths may deeply affect small communities because the community members are often quite well known to each other.

4.2 Health Conditions

Tobacco use has a direct impact on health status and is a major cause of illness and death. In winter 2000 to 2001, 26% of Canadians smoked, as did 28% of Albertans. In HR 17, which includes High Level, an estimated 27% of the residents smoked tobacco (Statistics Canada 2003d).

Information on the incidence of respiratory diseases in HR 17 is not presently available.

The tuberculosis rate in HR 17 in 2001 was 30.2 per 100,000, almost eight times the 3.91 rate for all of Alberta. As is true elsewhere in Canada, the rate for HR 17 has increased since 1995, up from 11.7 per 100,000. The Alberta rate for 1995 was 4.6 (Alberta Health and Wellness 2004).

STI rates in HR 17 have been about one third higher than in all of Alberta. Between 1998 and 2002, the rates of these diseases rose in this Region from 700 to 930 per 100,000 population, a somewhat greater relative increase than that for all of Alberta, which increased from 298 to 362 per 100,000 population.

The rates of selected infectious and parasitic diseases, including pertussis, rubella, measles, *Haemophilus influenzae* (Hib) and diphtheria, in HR 17 are generally no higher than in the whole province. Pertussis was an exception in 2001, and the explanation might have been a local epidemic. The people of HR 17 are no more at risk from these diseases than people elsewhere in the province.

Community-specific mortality data by cause is not currently available for the communities in northwestern Alberta. However, data exists for all of HR 17, showing the potential years of life lost, i.e., the number of years of life less than 75 lost to various diseases and disorders. The data show that more years were lost in HR 17 than in Alberta, during both 1992–1994 and 1997–1999, for both men and women. Although there was a reduction in the years lost for women between

1992–1994 and 1997–1999, the men experienced an increase in lost years during this period.

Information on deaths by cause in HR 17 and Alberta for 1992–1994 and 1997–1999 is of particular interest because of the numbers of people employed in higher risk occupations and the numbers of Aboriginal people in HR 17. The death rates for injuries and motor vehicle-related deaths were higher than in all of Alberta. Rates for women were lower than rates for men for these causes of death.

The rates of suicide deaths were higher in both 1992–1994 and 1997–1999 for males and females combined in HR 17 than in Alberta, as were the rates for males alone. The suicide rate for women in 1993–1994 was higher in HR 17 than in Alberta, but the reverse was true in 1997–1999.

HR 17 death rates for cancer, heart attack, stroke and pneumonia were all lower than the Alberta rates for these causes, because the population of HR 17 is much younger than the all-Alberta population.

Table 4-1 shows hospitalization rates per 100,000 population for selected mental and emotional problems for HR 17 and all of Alberta for 1996–1997 and 2001–2002. No gender breakdown of the rates is available. In both years, the rates of neuroses, depression and hypertension disease were higher in HR 17 than in all of Alberta. The rates decreased for all three illness conditions between 1996–1997 and 2001–2002 in both jurisdictions. Generally, the reductions had the effect of reducing the rates in HR 17 relative to those for all of Alberta.

Table 4-1: Hospitalizations for Selected Mental and Emotional Disorders for Alberta and Health Region 17

Years	Neuroses		Depression		Hypertension Disease	
	Alberta (No./100,000)	HR 17 (No./100,000)	Alberta (No./100,000)	HR 17 (No./100,000)	Alberta (No./100,000)	HR 17 (No./100,000)
1996–1997	59.1	81.3	38.5	184.3	53.4	119.3
2001–2002	45.8	72.2	32.5	52.9	45.6	86.6
NOTE: Rate per 100,000 population						
SOURCE: Alberta Health and Wellness (2004)						

4.3 Health Care Facilities and Services

Health care services are supplied by Northwestern Health Services, with a staff of over 250 serving the 18,000 residents in the area that includes High Level. The High Level Hospital supplies treatment region-wide, providing eight acute treatment beds and the High Level Medical Clinic. Patients with conditions that challenge the local services are transported to a larger facility in Edmonton.

4.4 Family and Community Conditions

Alcohol abuse is the source of most wellness and policing problems in northwestern Alberta. The High Level RCMP detachment, like detachments in many other northern communities, reported that 80 to 90% of the workload is a result of alcohol consumption and abuse. Most of their problems are with Aboriginal people, comprising about half of the permanent populations of their service areas.

The pressures on the High Level RCMP detachment are presently so great that they investigate incidents only if they involve physical injuries (Assumption RCMP commanding officer 2004, personal communication; High Level RCMP commanding officer 2004, personal communication).

More detail is available from the High Level detachment in the form of selected offence rates. In 2003, the rates of charges laid by the High Level detachment were as follows:

- violent crimes – 78 per 1,000 population
- property crimes – 122 per 1,000 population
- various liquor offences – 475 per 1,000 population

These rates are generally comparable with some Northwest Territories regions in 2000, which were as high as:

- violent crimes – 76 per 1,000 population
- property crimes – 85 per 1,000 population
- various liquor offences – 462 per 1,000 population

However, although these rates for communities in the Northwest Territories usually involve local residents, this is not true of the offenders that the High Level RCMP deals with. During August, September and October 2003, of the 635 people detained in cells by High Level RCMP, only 6% were High Level residents.

During the year, the rate for prisoners in cells was 893 per 1,000 High Level population, but as just noted, most of these prisoners were not High Level residents. The pressures on cell facilities is often so great that at times some prisoners have to be driven from the High Level detachment to be held in RCMP cells in Assumption or Fort Vermillion. At other times, prisoners must be transported from the Assumption detachment to holding cells in High Level (High Level RCMP commanding officer 2004, personal communication; Assumption RCMP commanding officer 2004, personal communication).

The commanding officer of the High Level detachment emphasized that generally a relatively small number of people commit the same offences and are repeatedly placed in cells (High Level RCMP commanding officer 2004, personal communication).

Drugs are available in all northwestern Alberta communities, as in generally all Alberta communities. The Alberta Youth Experience Survey (Alberta Alcohol and Drug Abuse Commission 2004) found the following percentages of adolescent drug use in Grades 7 through 12:

- cannabis – 28%
- mescaline – 10%
- *club drugs*, e.g., ecstasy – 5%
- cocaine – 3%

Cocaine and crack are available in High Level (High Level RCMP officers 2004, personal communication).

The incidences of domestic issues are relatively rare in High Level. In October and November 2003, there were only nine incidents.

Other indications of family and community conditions in this area include data from the High Level Women’s Shelter, and from Child Protection Services.

Table 4-2 provides information on child protection cases and children in care for Municipal District No. 23 and all of Alberta. The child protection caseload consists of both children in the care of the Child Protection Director and other children not in the care of the Director, but whose situations have been or are under observation because of child protection concerns. For the most part, children in care are not living at home.

Table 4-2: Children Taken into Care in Municipal District No. 23 and Alberta

Case Type	Municipal District No. 23		Alberta	
	1998–1999	2002–2003	1998–1999	2002–2003
Child protection cases (No./10,000 families)	256	479	1,025	992
In foster care (No.)	85	147	93	105
Aboriginal protection cases (No.)	171	262	141	165
Aboriginal protection cases (%)	67	55	40	44
Children in care (No.)	137	170	203	233
Aboriginal children in care (No.)	68	147	99	125
Aboriginal children in care (%)	50	86	51	54
NOTE: Rates per 10,000 families with children, by fiscal year				
SOURCE: Government of Alberta, Child and Family Services (2004b)				

The data shows that the Alberta rates of child protection and children in care are both higher than the Municipal District No. 23 rates in 1998–1999 and 2002–2003. However, the child protection caseload increased substantially during this period in the municipal district, but fell slightly in Alberta. The rates of children in care increased in both the municipal district, by 24%, and in the province, by 15%, during this period. These differences were greater for Aboriginal children. Their rates in protection and in care were higher in Municipal District No. 23 than in Alberta in both 1998–1999, and 2002–2003. Although these rates increased during this period in both jurisdictions, the increases were much greater in the municipal district. Aboriginal children also comprised higher percentages of all protection and all in care cases in the municipal district than in Alberta.

Generally, the data shows that there is less need for child protection in Municipal District No. 23 than in Alberta, but also that the protection and in care incidence rates of Aboriginal children are higher than for all Alberta children. Moreover, although both are increasing, the rates for Aboriginal children are increasing much more rapidly.

4.5 Social and Protection Facilities and Services

Family Community Support Services in High Level provides referral services and information to the residents of this community, under a mandate to serve all ages. This office employs a community youth worker–program assistant and a receptionist–community resource worker.

Table 4-3 shows that a 14-officer RCMP detachment in High Level supplies policing services to the surrounding region.

Table 4-3: Protection Service Features for the Industrial and Commercial Centres in Northwestern Alberta (2001)

Location	RCMP – Officers and Facilities		Number of Firefighters	Current Emergency Plan
	Number of Officers	Number of Cells		
High Level	14	Multiple, including male and female holding cells	1 C 35 V	Yes
Rainbow Lake	Policed by the 7-officer Assumption detachment	8, including male and female holding cells	15 V	Yes
Zama City	Policed by the 7-officer Assumption detachment	0	10 V	Yes
NOTES: V = volunteer C = career				
SOURCE: High Level and Assumption RCMP detachment officers (2004, personal communications), High Level, Rainbow Lake and Zama City fire chiefs (2004, personal communication)				

High Level is the only Alberta ICC that has a professional firefighter as fire chief. He provides some advisory services to Rainbow Lake and Zama City, and is assisted by 35 volunteer firefighters when responding to fires in High Level.

4.6 Education and Training

4.6.1 Levels of Education and Training

Table 4-4 shows that in 2001, 70% of people aged 20 years and older were high school graduates in High Level. The percentage of those aged 20 and over in that year that had some post-secondary education was 61% for High Level. However, the 2001 rates are for persons aged 20 years and over, whereas the 1991 data are for those aged 15 years and older. This helps to explain the 12% apparent increase in high school graduates, and the 15% increase in post-secondary training in High Level between 1991 and 2001.

Table 4-4: Education Attainment for the Industrial and Commercial Centres in Northwestern Alberta

Location	High School Graduation		Some Post-Secondary Education	
	1991 ¹ (%)	2001 ² (%)	1991 ¹ (%)	2001 ² (%)
High Level	58	70	46	61
Rainbow Lake	70	77	58	56
Zama City	–	74	–	42
NOTES: – = data not available 1 Percentage of population, aged 15 years and older 2 Percentage of population, aged 20 years and older				
SOURCE: Statistics Canada (1991, 2001)				

Table 4-5 shows the highest education or training achievement level of those aged 20 years and over. High Level had 37% of its population with some college or university training. The data shows that in comparison with men, slightly lower percentages of women in these communities were high school graduates. Although fewer women had trades or technical training, more had some college or university education, in comparison with men, in 2001.

Table 4-5: Highest Level of Education for the Industrial and Commercial Centres in Northwestern Alberta (2001)

Communities	Gender	Total Aged 20–64 (%)	Less than High School Graduation (%)	High School Graduates Only (%)	Some Trades or Technical Training (%)	Some College or University (%)
Alberta	Total	1,816,025	22	25	14	38
	Male	911,510	22	24	20	34
	Female	904,515	21	27	9	43
High Level	Total	2,115	29	20	15	37
	Male	1,100	27	20	23	30
	Female	1,020	30	20	6	44
Rainbow Lake	Total	670	24	33	23	19
	Male	370	18	31	34	18
	Female	310	31	37	10	21
Zama City	Total	670	47	53 ^a	42 ^b	–
NOTES: a All high school graduates b All with post-secondary training						
SOURCE: Statistics Canada (2004c)						

4.6.2 Education and Training Facilities

Table 4-6 shows the school profile of Fort Vermillion School Division No. 52 that operates the education services in High Level. Two schools in High Level provide kindergarten to Grade 12 education. The Florence MacDougall Community School had a utilization rate in 2003 of about 90%.

Table 4-6: School Profile Data for the Industrial and Commercial Centres in Northwestern Alberta (2003)

Location	School	Teachers (No.)	Grades Taught	School Capacity (No.)	School Enrollment (No.)
High Level	High Level School	26	K to 12	–	422
	Florence MacDougall Community School	18	K to 12	392	342
	Fairview College	–	Post-secondary	–	–
	High Level Christian Academy	5	K to 9	75	68
	Holy Cross All-grade School	22	K to 9	800	452
Rainbow Lake	Rainbow Lake School	18	K to 12	320	206
Zama City	Zama City School	2	1 to 8	75	22
NOTES: – = data not available K = kindergarten					
SOURCE: High Level school personnel, 2003, personal communication; Rainbow Lake school personnel, 2003, personal communication; Zama City school personnel, 2003, personal communication					

A branch of Fairview College in High Level provides some post-secondary training.

5 TRADITIONAL CULTURE

Approximately 22% of High Level residents have Aboriginal origins. In common with all cultures, the Dene and Métis cultures include 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 traditional harvesting and adherence to traditional beliefs and values is currently not available for the northwestern Alberta ICCs.

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 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 projects

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 study area. 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 that the project could affect, including:

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

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

6.2.3.1 Land Ownership

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

- federal Crown lands – federal lands administered by Indian and Northern Affairs Canada (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 projects 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 projects, 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 construction. Granular resources were chosen as a valued component because industrial developments and local communities need these resources for construction and maintenance. These materials are sometimes difficult to obtain in the North.

6.2.3.3 Timber Resources

Although the anchor fields do not contain timber, other segments of the projects 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 projects. Oil and gas activities were chosen as a valued component because of the strong potential for future oil and gas development in general, and specifically in the study 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 projects, 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 projects occur 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 components of the projects, particularly the facilities, has the potential to affect visual and aesthetic values.

6.3 Baseline Conditions

6.3.1 Land Ownership

Lands traversed by the projects in northwestern Alberta are all provincial Crown lands administered by Alberta Sustainable Resource Development (ASRD) (see Figure 6-1).

6.3.2 Granular Resources

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

6.3.3 Timber Resources

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

6.3.4 Mineral Resources

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

6.3.5 Oil and Gas Activities

Several existing oil and gas developments are located in the study area within Alberta (Alberta Energy 2002). Developments include seismic exploration, well sites and pipelines. The companies involved in these activities include Talisman Energy, Husky Oil Operations Ltd. and Archean Energy Ltd. The Mackenzie Gas Project pipeline corridor deviates from the Enbridge Norman Wells pipeline north of the Alberta boundary. Just south of the Alberta boundary, the Mackenzie Gas Project terminates and will link to the proposed NGTL ancillary project. The Enbridge pipeline continues to its terminus at Zama City. Oil and gas dispositions within and near the study area in Alberta are not shown in Figure 6-2 as they are too numerous to map at this scale.

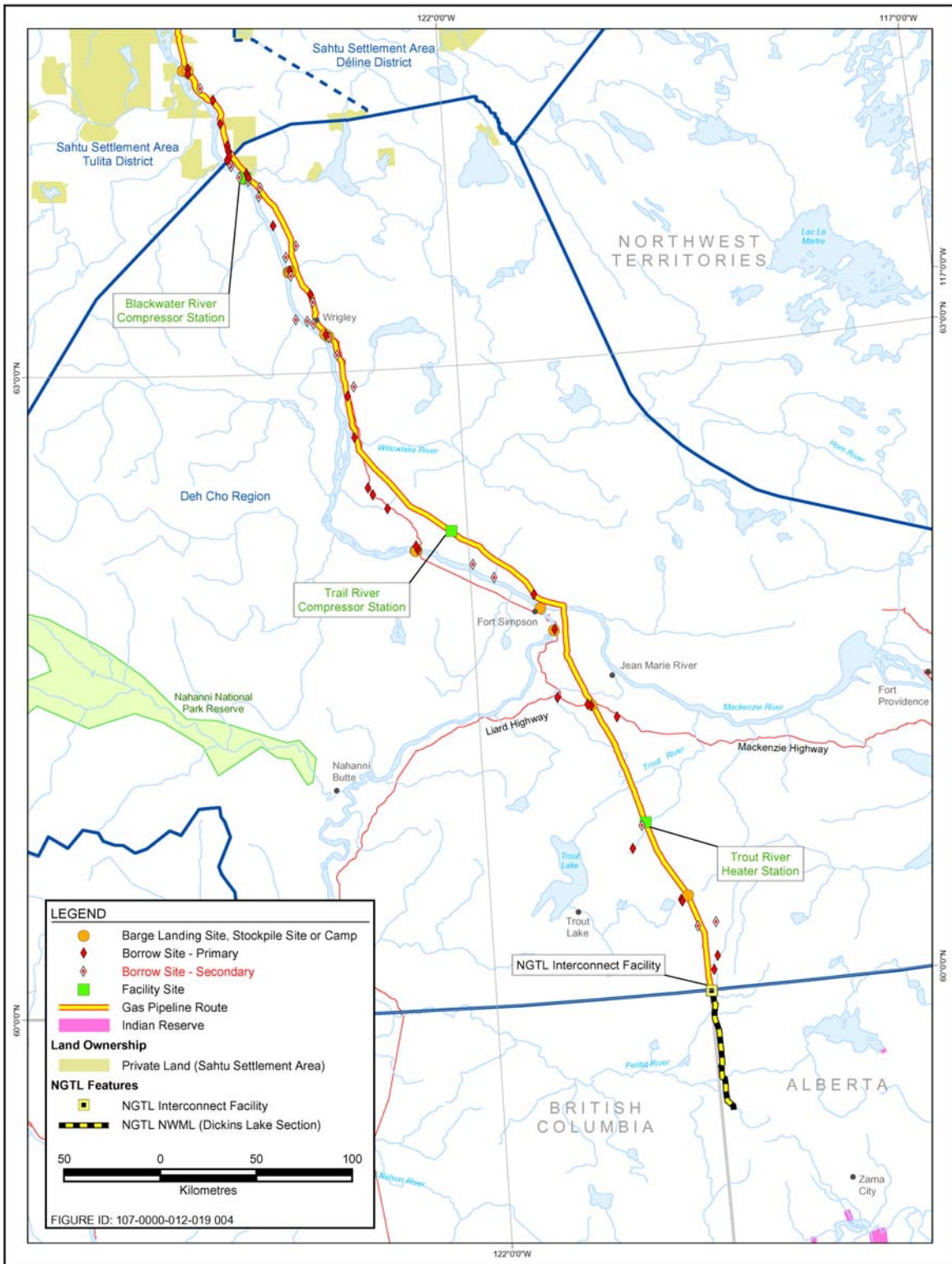


Figure 6-1: Land Ownership – Deh Cho Region and Northwestern Alberta

6.3.6 Nontraditional Resource Harvesting

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

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

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

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

- Arctic grayling
- walleye
- burbot
- northern pike
- whitefish

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

6.3.7 Tourism and Recreation

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

6.3.8 Other Commercial Activities

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

6.3.9 Environmentally Protected Areas

In Alberta, the study area lies within a Caribou Protection Area (ASRD 2002c) (see Figure 6-3). The pipeline corridor does not traverse any other existing or proposed protected areas in Alberta (Alberta Environment 2001, Boyd PetroSearch Ltd. 2001).

6.3.10 Visual and Aesthetic Resources

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

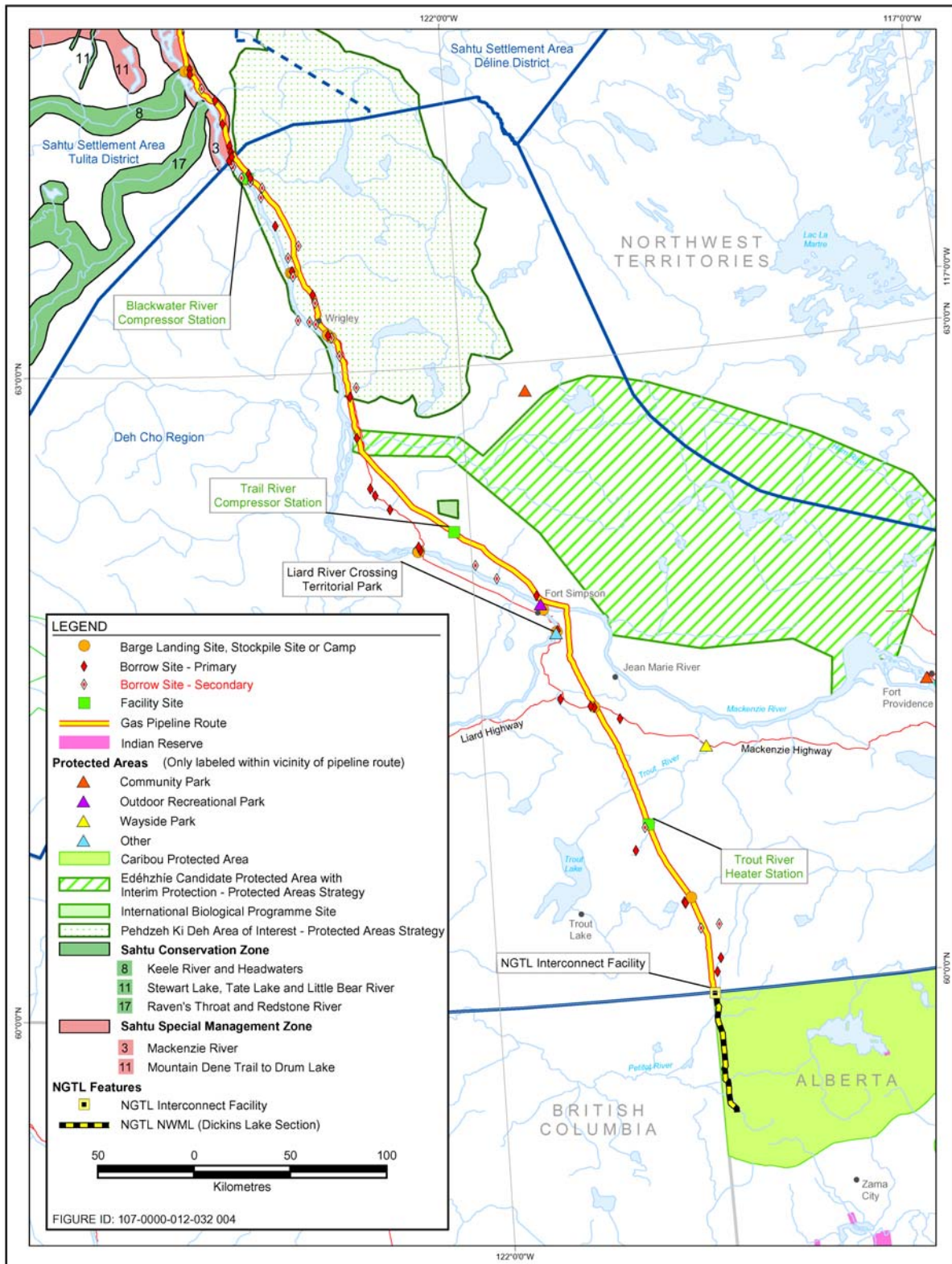


Figure 6-3: Protected Areas – Deh Cho Region and Northwestern Alberta

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. 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 High Level Area

7.2.1 Prehistory

The prehistory of the High Level area is adapted from the EIS, Volume 4, Section 7.3.1.3, Northwestern Alberta Prehistory.

As with the Mackenzie Valley area, a relative paucity of previous archaeological investigations in northwestern Alberta leaves many questions unanswered concerning the exact nature of the prehistoric occupation of this region. The prehistoric sequences outlined for nearby areas, such as the lower Liard River Basin and northeastern corner of British Columbia, would appear to be relevant for the portion of northwestern Alberta through which the pipeline facilities will pass. In broad terms, the same major components for Canadian boreal forest prehistory in the Gwich'in, Sahtu and Deh Cho areas might apply to northwestern Alberta.

Little information from the Early Prehistoric Period has been recovered in northern Alberta. Although Clovis is the first well-documented culture in North America (about 11,500 to 10,500 before present [BP]), so far there are no known Clovis sites in the region. However, evidence of this early occupation has been recovered from northeastern British Columbia near Fort St. John. Clovis groups colonized Alberta from the south, and likely entered northwestern Alberta during later stages of deglaciation.

Early Prehistoric occupations in this region are not well defined, and usually occur in a disparate series of material expressions that lack a clear range of radiocarbon dates. Finds of toolkits that include bifacially flaked tools in their earliest expressions and later microblade technology, are thought to be early, and have been assigned as the Early Northwest Interior Culture.

Evidence of the Acasta Lake Complex, dating between 7,000 and 5,000 BP, has also been found nearby. Originating from earlier Northern Plano traditions in the North, this complex represents an adaptation to forest and barrenland environments. Dating to about 3,990 BP, a series of Middle Prehistoric Period occupations have been identified in the Fort Liard region, belonging to the Julian Complex of the Northwest Microblade Tradition. These combine technological traits of the earlier Palaeo-Arctic Tradition of Alaska with lanceolate and notched projectile points that have a southerly stylistic origin.

In northern Alberta, the Middle Prehistoric Period also likely encompasses the Taltheilei Tradition, starting at 2,650 BP, which was defined for the barrenlands but can sometimes be found as far south as central Alberta. In its earliest expression, this tradition includes large lanceolate and stemmed points, and it is considered to represent Athapaskan-speaking people ancestral to the historic Dene.

Evidence of Late Prehistoric Period occupation in northern Alberta is dated as Late Taltheilei Phase. This occupation is characterized by the presence of small side-notched projectile points that might be termed prairie side-notched if they had been found on the Plains. These types likely represent the diffusion of bow-and-arrow technology into the region rather than a direct southern cultural presence.

7.2.2 History and Cultural Context

The history overview and cultural context of the High Level area is adapted from the EIS, Volume 4, Section 7.3.2, History Overview and Section 7.4.5, Baseline Conditions – Northwestern Alberta.

A synopsis of the historic past is a big 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 and northwestern Alberta were introduced, by Cree or Chipewyan middlemen, to a few European trade items, such as knives and hatchets. Initial contact between the Slavey and the 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 2, 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 in the Sahtu Settlement Area (SSA) 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 boats and steamboat (Slobodin 1981b). Today, the Métis live throughout the Mackenzie region, although they have a collective identity based on a shared heritage.

During the 1977 Berger inquiry into the Mackenzie Valley pipeline (Berger 1977), the Dene and Métis insisted that outstanding land claim issues be resolved before planning further development in the Mackenzie Valley. Negotiations to settle these claims began in October 1991, with the final agreement signed in 1994 (Simpson 2002).

The Slavey people also extend into northern Alberta, where they are known as the Acha'ottine, or woodland people. These Athapaskan-speaking people refer to themselves as the Dene Tha'. Although culturally and linguistically similar to the Slavey of the Northwest Territories, they are geographically located in the northwest corner of Alberta.

The traditional lands of the Dene Tha' extend from northwestern Alberta into northeast British Columbia, and into the southern regions of the Northwest Territories (Ross 2001). Although the Dene Tha' adhered to Treaty 8 in 1900, their reserves were not surveyed until 1946. Concentrated settlement was part of a larger plan by the government to facilitate assimilation of Aboriginal people into non-Aboriginal society (Royal Commission on Aboriginal Peoples 1996). Construction of a residential school in Assumption (now Chateh) by the Catholic Church also encouraged settlement, as families wanted to live near their children. What resulted was development of three communities in northwestern Alberta where most of the Dene Tha' population live: Chateh, Bushe River and Meander River.

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GLOSSARY

abandonment	The act of permanently stopping operations, discontinuing service, removing facilities and restoring land to a productive state.
Aboriginal	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.
Aboriginal community	A community in which the majority of residents are Aboriginal.
ADF	The abbreviation for automatic direction finding.
anchor field	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.
archaeological site	A site where an archaeological artifact is found.
artifact	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.
ASRD	The abbreviation for Alberta Sustainable Resource Development.
AWOS	The abbreviations for automated weather observation station
baseline conditions	Existing conditions in the communities and ethnic regions of the area before any project effects are experienced.
baseline information	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.
BDR	The abbreviation for Beaufort Delta Region.

biophysical environment	The components of the earth including: <ul style="list-style-type: none">• land, water and air, including all layers of the atmosphere• all organic and inorganic matter and living organisms• the interacting natural systems that include components referred to in the previous bullets
borrow site	An area that could be excavated to provide material, such as gravel or sand, to be used as fill elsewhere.
BP	The abbreviation for before present.
CARS	The abbreviation for community airport radio station.
CD	The abbreviation for Census Division.
commercial harvest	Occupied with or engaged with harvest intended for commerce, i.e., buying and selling a product, including transportation from place to place.
Commissioner's lands	Federal lands administered by the territorial government.
compressor station	A facility containing equipment that is used to increase pressure to compress natural gas for transportation.
country food	Food traditionally harvested and eaten by local Aboriginal residents.
critical habitat	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 <i>Species at Risk Act</i> .
decommissioning	The act of taking a processing plant or facility out of service and isolating equipment, to prepare for routine maintenance work, suspending or abandoning.
devolution	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.
DME	The abbreviation for distance measuring equipment.

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

FSS	The abbreviation for flight service station.
gas pipeline	The pipeline that transports compressed natural gas from the Inuvik area facility to the southern terminus near the Northwest Territories–Alberta boundary.
gathering pipelines	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.
gathering system	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.
GNWT	The abbreviation for Government of the Northwest Territories.
granular resources	Sand, gravel, clay, quarry materials and silt.
GSA	The abbreviation for Gwich'in Settlement Area.
heavy drinking	Consuming five or more drinks at one sitting.
heritage resources	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.
heritage resources	Cultural, historic, archaeological and palaeontological resources are collectively known as heritage resources and can include pre-contact and post-contact features.
Hib	The abbreviation for <i>Haemophilus influenzae</i> .
historic archaeological resources	Sites, artifacts, structures and documents that relate to the influx of Euro-Canadians in the region, and date to the last 250 years.
honey bag	A plastic liner used in non-flush toilets which is removed when full.
HR	The abbreviation for Health Region.

HSS	The abbreviation for Health and Social Services (GNWT Department).
human health	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.
human health assessment	Considers the effect of hazardous substances, environmental factors and exposure conditions on local and regional populations. It might consist of qualitative and quantitative assessments.
ICC	The abbreviation for industrial and commercial centre.
ILS	The abbreviation for instrument landing system.
INAC	The abbreviation for Indian and Northern Affairs Canada (Government of Canada).
infrastructure	Basic facilities, such as transportation, communications, power supplies and buildings, which enable an organization, project or community to function.
Inuvik area facility	The gas and NGL processing facility for the Mackenzie Gas Project to be located near Inuvik.
ISR	The abbreviation for Inuvialuit Settlement Region.
JRP	The abbreviation for Joint Review Panel.
lateral	A pipe that branches away from the central and primary part of the system.
limiting factor	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.
local study area	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.
LSA	The abbreviation for local study area.
major repairs (housing)	Refers to such conditions as defective plumbing or electrical wiring, or structural repairs to walls, floors or ceilings.

Métis	A person with a mixture of Aboriginal and non-Aboriginal ancestry.
migrants	Individuals moving to a different community.
migratory bird	Any migratory bird as referred to in the <i>Migratory Birds Convention Act</i> , including the sperm, eggs, embryos, tissue cultures and parts of the bird.
minor repairs (housing)	Refers to such conditions as missing or loose floor tiles, brick or shingles, or to defective steps, railing or siding.
mitigation	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.
monitoring	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.
municipal lands	Lands administered by the territorial government or the municipality.
NDB	The abbreviation for nondirectional beacon.
NGL	The abbreviation for natural gas liquid.
NGL pipeline	The pipeline connecting the Inuvik area facility with the Enbridge Pipeline facilities at Norman Wells.
NGO	The abbreviation for nongovernmental organization.
NGTL	The abbreviation for NOVA Gas Transmission Ltd.
NGTL interconnect facility	The northern terminus of the NGTL pipeline system to be located in northwestern Alberta that will directly connect the southern terminus of the Mackenzie Valley pipeline to the NGTL pipeline system.

Niglintgak	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.
Niglintgak lateral	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.
nonrenewable resources	Resources, such as fossil fuels (oil, gas, coal) and minerals that occur naturally but cannot be replaced once exploited.
nonresident	An individual who resides outside the Northwest Territories.
nontraditional land use	Existing land and resource uses for nontraditional users, including residents and nonresidents within the study area.
nontraditional resource harvesting	Includes hunting, fishing and trapping pursued by non-Aboriginal residents. May be for domestic, sport or commercial purposes.
Operations Phase	The phase of a project during which the pipeline and associated facilities are operated.
palaeontological sites	Sites bearing evidence of multi-cellular invertebrate, vertebrate faunal remains and plant materials that have been fossilized or otherwise preserved.
Parsons Lake	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.
Parsons Lake lateral	The gathering pipeline connecting the Parsons Lake gas conditioning facility to a connection point at the Storm Hills pigging facility.
participation rate	Percentage of population, aged 15 years and older in the labour force.
physical infrastructure	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.

pipeline	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 <i>National Energy Board Act</i> .
pipeline corridor	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.
potential labour supply	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.
prehistoric archaeological resources	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).
private lands	Lands administered by the land administration within the settlement region.
production area	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.
project proponents	The five organizations (Imperial, the APG, ConocoPhillips, Shell and ExxonMobil) that are undertaking the Mackenzie Gas Project.
project, the	The abbreviation for the Mackenzie Gas Project.
project-specific effect	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).
property crime	Breaking and entering, theft of motor vehicles, theft over \$5,000, theft \$5,000 and under, possession of stolen goods, and fraud.

provincial Crown lands	Lands administered by the Alberta Public Lands Administration.
RCMP	The abbreviation for Royal Canadian Mounted Police.
reclamation	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.
recovery strategy	A strategy for the recovery of a listed extirpated, endangered or threatened species prepared by the competent minister (as defined under the <i>Species at Risk Act</i>). 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 <i>Species at Risk Act</i> .
regional study area	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.
regular maintenance (housing)	Refers to such conditions as requiring painting or furnace cleaning.
resident	A Canadian citizen or landed immigrant who has been living in the Northwest Territories for at least two years.
residual effects	Environmental or socio-economic effects that remain after mitigation. Effects that are present after mitigation is applied.
right-of-way	The strip of land a company has acquired, for which it has obtained the rights to construct and operate a pipeline.
RSA	The abbreviation for regional study area.

scrip	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.
SEIA	The abbreviation for socio-economic impact assessment.
social infrastructure	Health, social wellness and education services that may require enhancement or expansion as a result of project-related activities.
socio-economic effect	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.
species at risk	An extirpated, endangered or threatened species or a species of special concern, as defined in the <i>Species at Risk Act</i> .
species of special status	Species listed under provincial jurisdiction or of recognized local importance because they are vulnerable, threatened, endangered or extirpated.
SSA	The abbreviation for Sahtu Settlement Area.
STI	The abbreviation for sexually transmitted infection.
Storm Hills lateral	The gathering pipeline connecting the Storm Hills pigging facility to a connection point at the inlet of the Inuvik area facility.
study area	The area within the spatial boundaries of the scope of the environmental and socio-economic effects assessment.
subsistence harvest	The minimum harvest necessary to provide food to support families living within the communities.
Taglu	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.
Taglu lateral	The gathering pipeline connecting the Taglu gas conditioning facility to a connection point at the Storm Hills pigging facility.

unemployment rate	Percentage of the labour force that was unemployed during the week before the survey.
valued component	Characteristic or features that represent important environmental or socio-economic conditions identified by assessment specialists, communities or stakeholders.
violent crimes	Homicide, attempted murder, sexual assault, nonsexual assault, other sexual offences, abduction and robbery.
visual resources	Land, water, vegetation, animals and structures that are visible on the land.
VOR	The abbreviation for VHF omnidirectional range.
waterbody	A body of water up to the high-water mark, including canals, reservoirs, oceans and wetlands, but not including sewage or waste treatment lagoons.
well-being	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.
wellness	Includes physical, emotional and mental health, and relationship well-being.

