



Sahtu Land Use Planning Board



Sahtu Land Use Plan **Background Report**

July 2010

Sahtu Land Use Plan Background Report: The Sahtu Settlement Area

The Sahtu Land Use Plan Background Report

The Sahtu Land Use Plan Background Report, from now on referred to as the “Background Report”, is intended to capture some of the main characteristics of the Sahtu Settlement Area (SSA), its people, the culture, special places, the biophysical environment, the economy and the regulatory regime. Above all, the Background Report should help readers better understand the Sahtu and the reports and information that were considered in the development, decisions, and planning that resulted in the Sahtu Land Use Plan (SLUP).

Introduction

The Sahtu Land Use Plan was written by taking into account the three pillars of sustainability: socio-cultural, economic and ecological factors. These three domains are now commonly considered part of a balanced approach to decision-making. The background report is an attempt to briefly describe some of the social, cultural, economic and ecological factors that the Sahtu Land Use Planning Board (SLUPB) has considered in its decision making.

INAC’s Sustainable Development Strategy 2007-2010 describes sustainable communities as those which “enjoy a **prosperous economy**, a **vibrant and just society**, and a **healthy environment for current and future generations**.”¹

The Sahtu Land Use Planning Board has sought to develop a balanced plan for the Sahtu Settlement Area (SSA) by considering a diversity of resources under each of the three pillars. A summary of the sources used and a general description of the Sahtu Settlement Area follow.

¹ INAC Sustainable Development Strategy 2007-2010, P. 4: www.ainc-inac.gc.ca/sd/index_e.html

TABLE OF CONTENTS

ACRONYMS	8
CHAPTER 1: SOCIETY AND CULTURE	10
1.1 THE SAHTU SETTLEMENT AREA (SSA)	10
1.1.1 Boundaries	10
1.1.2 Land Ownership and Organization	10
1.2 THE PEOPLE	15
1.2.1 The Sahtu Dene and Métis	15
1.2.2 Sahtu Communities	15
1.2.3 Statistical Overview of the Sahtu	18
1.3 CULTURE	23
1.3.1 Traditional Knowledge (TK)	23
1.3.2 Sahtu Dene and Métis Spirituality	27
1.3.3 Youth and the Land	30
1.3.4 Ongoing Relationship with the Land	31
1.4 RAKEKÉE GOK'É GODI: PLACES WE TAKE CARE OF	32
CHAPTER 2: BIOPHYSICAL ENVIRONMENT	35
2.1 GEOLOGY	35
2.1.1 Topography	37
2.2 CLIMATE	37
2.2.1 Temperature	37
2.2.2 Permafrost	40
2.2.3 Climate Change	40
2.3 WATER AND WATERSHEDS	44
2.3.1 Draft NWT Water Stewardship Strategy	45
2.3.2 Watersheds	45
2.3.3 Community Source Drinking Watersheds	49
2.4 LANDCOVER AND ECOREGIONS	51
2.4.1 Boreal Biome	51
2.4.2 Forest Fires	51
2.4.3 Ecological Classification	52
2.5 ECOLOGICALLY SIGNIFICANT AREAS	59
2.5.1 Representation Analysis	59
2.5.2 Karst Landforms	60
2.5.3 International Biological Program (IBP) Sites	63
2.6 WILDLIFE	63
-----	63
2.6.1 Species of Importance in the Sahtu Settlement Area (SSA)	64

2.6.2 Species at Risk and COSEWIC	66
2.6.2 Canada's Species at Risk Act (SARA)	68
2.6.3 Northwest Territories (NWT) Species at Risk Act	68
2.6.4 Habitat Sites and Harvesting Sites	69
2.6.5 Sources Used	70
2.6.6 Species Specific Wildlife Maps	82
CHAPTER 3: ECONOMIC DEVELOPMENT & NATURAL RESOURCES	95
3.1 INDUSTRY	95
3.1.1 Oil and Gas	95
3.1.2 Minerals and Mining	101
3.1.3 Granular Deposits	109
3.1.4 Contaminated Sites and Waste Remediation	111
3.1.5 Forestry	112
3.1.6 Fishing	115
3.2 TOURISM	115
3.2.1 Big Game and Sport Fishing Outfitters	116
3.2.2 Sport Fishing and Ecotourism	118
3.3 INFRASTRUCTURE AND TRANSPORTATION	119
3.3.1 Energy & Power Development	119
3.3.2 Transportation	121
CHAPTER 4: REGULATORY ENVIRONMENT	125
4.1 MACKENZIE VALLEY RESOURCE MANAGEMENT ACT (MVRMA)	125
4.2 DESIGNATED SAHTU ORGANIZATIONS (DSOs)	126
4.3 CO-MANAGEMENT BOARDS IN THE SSA	127
4.3.1 Sahtu Land Use Planning Board (SLUPB)	128
4.3.2 Sahtu Renewable Resources Board (SRRB)	128
4.3.3 Renewable Resource Councils (RRC)	128
4.3.4 Sahtu Land and Water Board (SLWB)	129
4.3.5 Mackenzie Valley Land and Water Board (MVLWB)	129
4.3.6 Mackenzie Valley Environmental Impact Review Board (MVEIRB)	129
4.4 GOVERNMENT OF THE NORTHWEST TERRITORIES (GNWT)	131
4.4.1 Environment and Natural Resources (ENR)	131
4.4.2 Industry, Tourism and Investment (ITI)	131
4.4.3 Department of Transportation (DOT)	132
4.4.4 Municipal and Community Affairs (MACA)	132
4.5 GOVERNMENT OF CANADA	133
4.5.1 Indian and Northern Affairs Canada (INAC)	133

4.5.2 Department of Fisheries and Oceans Canada (DFO)	134
4.5.3 Environment Canada (EC), Canadian Wildlife Service (CWS) and Parks Canada (PC)	135
4.5.4 Transport Canada (TC)	136
4.5.5 Canadian Nuclear Safety Commission (CNSC)	136
4.5.6 National Energy Board (NEB)	137
4.5.7 Natural Resources Canada (NRCan)	138
Appendix 1. Level III Ecoregions	139

List of Tables

Table 1. Land Ownership in the Sahtu Settlement Area	10
Table 2. Examples of TK and Sources of Cultural Information	25
Table 3. Sahtu Land Use Plan Zone Designations	32
Table 4. SLUP Zone Designations of Sahtu Heritage Sites in “Places We Take Care Of”	33
Table 5. Canadian Climate Normals from 1970-2000 taken at Norman Wells	39
Table 6. Mean Rises in Seasonal Air Temperatures in the Sahtu	42
Table 7. Mackenzie River Water Quantity	47
Table 8. Great Bear Lake Watershed Break-Down	48
Table 9. Ecoregions in the Sahtu Settlement Area	55
Table 10. COSEWIC Assessment	67
Table 11. Sahtu Species on the COSEWIC List as of April 2009	67
Table 12. NWT Species at Risk in the SSA	69
Table 13. Species Considered in IWA Report that Occur in the Sahtu Settlement Area	82
Table 14. Important Wildlife Areas located in the Sahtu Settlement Area	83
Table 15. Oil and Gas Rights Issuance Process in the NWT	99
Table 16. Stages of Oil and Gas Exploration and Development	100
Table 17. Five Stages of Mineral Exploration and Development	107
Table 18. Licences and Applications for Mineral Exploration and Development	109
Table 19. Contaminated Sites in the SSA	113
Table 20. Mackenzie Valley Winter Road	122
Table 21. Level III Taiga Plains Ecoregions in the Sahtu	139
Table 22. Level III Cordillera Ecoregions in the Sahtu	140
Table 23. Level III Taiga Shield Ecoregions in the Sahtu	142

List of Maps

Map 1. Sahtu Settlement Area (SSA).....	11
Map 2. Sahtu Settlement Lands.....	13
Map 3. Traditional Cultural Groups of the Sahtu Settlement Area	16
Map 4. Significant Cultural Sites	26
Map 5. Sahtu Dene and Métis Traditional Trails	28
Map 6. Traditional Place Names.....	29
Map 7. Heritage Sites from “Places We Take Care Of”	34
Map 8. Geological Provinces	36
Map 9. Elevation and Contours.....	38
Map 10. Permafrost and Treeline.....	41
Map 11. Warming Trends °C/Decade 1979-2008.....	43
Map 12. Major and Regional Watersheds.....	46
Map 13. Community Drinking Water Source Catchments and Upstream Catchments	50
Map 14. Fire History in the SSA (1960-2005)	53
Map 15. Level I and II Ecoregions	57
Map 16. Level III and IV Ecoregions	58
Map 17. Marxan Ecological Representation Analysis	61
Map 18. Ecologically Significant Areas.....	62
Map 19. Special Harvesting Areas & FGH/Colville Lake Group Trapping Area	71
Map 20. SRRB Harvest Study by Density	74
Map 21. Bluenose West Caribou Migration.....	75
Map 22. Bluenose East Caribou Migration.....	76
Map 23. Dall’s Sheep.....	78
Map 24. Important Breeding Duck Habitat.....	79
Map 25. Important Wildlife Areas	84
Map 26. Bears	85
Map 27. Barren-Ground Caribou	86
Map 28. Boreal and Mountain Woodland Caribou	87
Map 29. Mountain Woodland Caribou Range	88
Map 30. Fish.....	89
Map 31. Furbearers	90
Map 32. Mountain Goat	91
Map 33. Moose	92
Map 34. Muskox.....	93
Map 35. Waterfowl and Birds	94
Map 36. Oil and Gas Potential	97
Map 37. Oil and Gas Rights.....	98
Map 38. Known Mineralization in the SSA.....	103
Map 39. Mineral Rights	104
Map 40. Granular Deposits.....	110
Map 41. Contaminated Sites	114
Map 42. Outfitting Regions and Tourism Establishments.....	117
Map 43. Hydro-Electric Potential in the Sahtu	120
Map 44. Existing and Proposed Infrastructure.....	123

List of Figures

Figure 1. Land Ownership Categories in the SSA.....	12
Figure 2. SSI and the Land Corporations	14
Figure 3. Sahtu Population in 2009	18
Figure 4. People with a High School Diploma or More Education from 1986 to 2006.....	19
Figure 5. Employment Rate in 1986 and 2006	20
Figure 6. Average Family Income in 2006.....	21
Figure 7. Food Price Index in 2004 and Living Cost Differential in 2005	22
Figure 8. Rights Management Process.....	101
Figure 9. Regulatory Bodies in the SSA	127
Figure 10. Three Levels of Environmental Impact Assessment.....	130

ACRONYMS

BLT	Block Land Transfer
CDD	Commercial Discovery Declaration
CNSC	Canadian Nuclear Safety Commission
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
CZ	Conservation Zone
DFO	Department of Fisheries and Oceans (now Fisheries and Oceans Canada)
DUC	Ducks Unlimited Canada
DSO	Designated Sahtu Organization
DOT	Department of Transportation (GNWT)
EC	Environment Canada
EL	Exploration Licence
ENR	Department of Environment and Natural Resources (GNWT)
FGH	Fort Good Hope
GBLW	Great Bear Lake Watershed
GBLWMP	Great Bear Lake Watershed Management Plan
GHG	Greenhouse Gas
GNWT	Government of the Northwest Territories
GRD	Granular Resources Directory
GUZ	General Use Zone
HB	High Boreal
HS	High Subarctic
IBP	International Biological Programme
INAC	Indian and Northern Affairs Canada
LS	Low Subarctic
ITI	Department of Industry, Tourism and Investment (GNWT)
IWA	Important Wildlife Areas
JRP	Joint Review Panel
MACA	Department of Municipal and Community Affairs (GNWT)
MB	Mid Boreal
MBIS	Mackenzie Basin Impact Study
MVEIRB	Mackenzie Valley Environmental Impact Review Board
MVLWB	Mackenzie Valley Land and Water Board
MVRMA	Mackenzie Valley Resource Management Act
NEB	National Energy Board
NRCan	Natural Resources Canada
NWT	Northwest Territories
NWTWA	Northwest Territories Waters Act
PAS	Protected Areas Strategy
PC	Parks Canada
PCI	Proposed Conservation Initiative
PL	Production Licence
RRC	Renewable Resources Council
SARA	Species at Risk Act
SDD	Significant Discovery Declaration

SDL	Significant Discovery Licence
SDMCLCA	Sahtu Dene and Métis Comprehensive Land Claim Agreement
SLUPB	Sahtu Land Use Planning Board
SLWB	Sahtu Land and Water Board
SMZ	Special Management Zone
SRRB	Sahtu Renewable Resources Board
SSA	Sahtu Settlement Area
SSI	Sahtu Secretariat Incorporated
TC	Transport Canada
TK	Traditional Knowledge

CHAPTER 1: SOCIETY AND CULTURE

1.1 THE SAHTU SETTLEMENT AREA (SSA)

1.1.1 Boundaries

The boundaries of the Sahtu Settlement Area (SSA) are identified in the Sahtu Dene and Métis Comprehensive Land Claim Agreement (SDMCLCA), settled in 1993. The SSA consists of approximately 283,171 km² in the Northwest Territories.

The SSA shares its borders with the:

- Inuvialuit Settlement Region to the north,
- Nunavut and the Tlicho Settlement Area to the east,
- Dehcho Territory to the south, and
- Yukon Territory and the Gwich'in Settlement Area to the west.

See Map 1. Sahtu Settlement Area (SSA).

1.1.2 Land Ownership and Organization

Of the 283,171 km² of land in the Sahtu Settlement Area (SSA), the Sahtu Dene and Métis have title to 41,437 km² and hold subsurface rights to 1,813 km² of land. The majority of the lands in the Sahtu are Crown land, owned by the federal government and administered by the department of Indian and Northern Affairs Canada (INAC).

Table 1. Land Ownership in the Sahtu Settlement Area

	Land Ownership	Surface/Subsurface rights
Sahtu Settlement Area (SSA)	Sahtu Lands (Dene & Métis owned)	Surface
		Subsurface
	Crown Land (Federal land)	Surface and subsurface
	Municipal Land (GNWT land)	Surface
	Block Land Transfers (GNWT land)	Surface

Source: Sahtu Dene and Métis Comprehensive Land Claim Agreement (1993)

Lands owned by the Sahtu Dene and Métis people are called Sahtu lands. Sahtu lands found within community boundaries are called Sahtu municipal lands. The SLUP does not apply to municipal lands. Those lying outside community boundaries are called settlement lands.

Community governments, private individuals and corporations also hold lands within community boundaries. Community boundaries are established by the Government of the Northwest Territories (GNWT) to delineate the geographic area that is within a community government's jurisdiction.

Map 1. Sahtu Settlement Area (SSA)

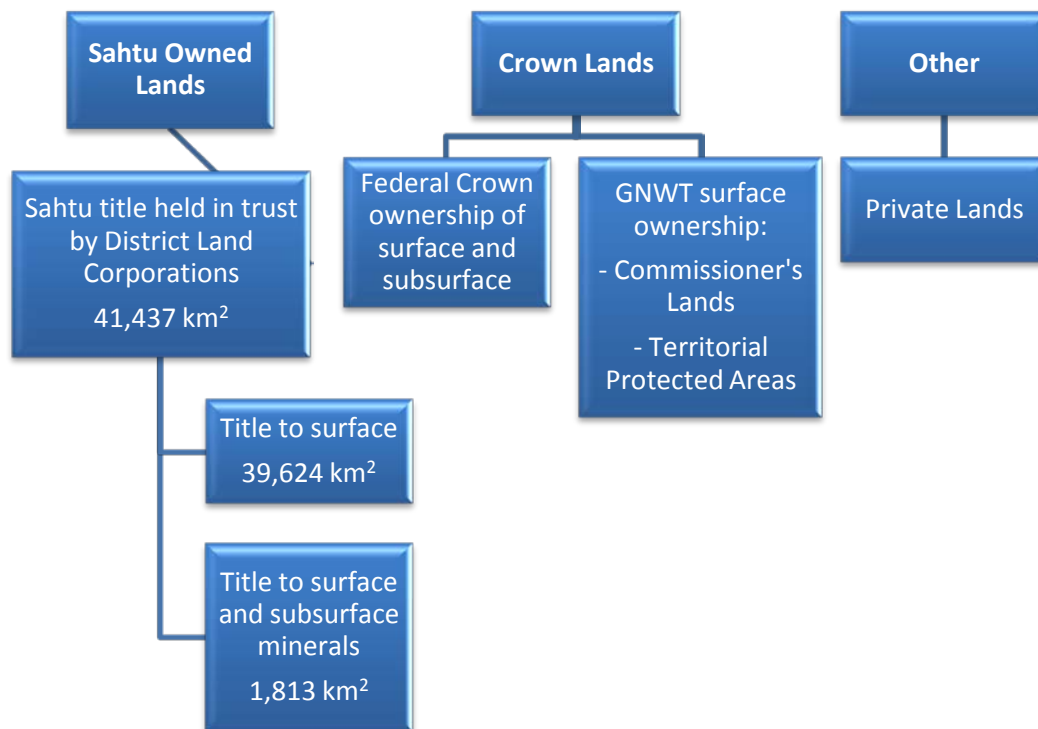
Block Land Transfers (BLT) are lands set aside by the GNWT for future community use and growth by the community governments. The GNWT administers significant areas of land within Block Land Transfer Boundaries and Community Boundaries, known as "Commissioner's Land."

In Colville Lake and Fort Good Hope the Block Land Transfer boundary and community boundary are identical. In Norman Wells, Tulita and Déline, Block Land Transfer boundaries are significantly larger than the community boundaries. The Plan does not apply to lands within community boundaries but does apply to lands within BLTs that lie outside of the community boundaries.

Within Block Land Transfer boundaries and community boundaries, there are significant areas of land transferred through the Sahtu Dene and Métis Comprehensive Land Claim Agreement (SDMCLCA). Sahtu lands were selected for a variety of reasons including spiritual value, traditional use, harvesting potential and revenue generating opportunities.

The Sahtu Land Use Planning Board only has the authority to plan for lands that fall within the SSA. All lands lying outside of the SSA boundary are not subject to the Plan and as a result, not discussed in this Background Report, or in the Plan.

Figure 1. Land Ownership Categories in the SSA



Source: Oil and Gas Approvals in the Northwest Territories – Sahtu Settlement Area, February 2002, The Regulatory Roadmaps Project

Figure 1 excludes land within community boundaries as the Sahtu Land Use Plan does not apply to municipal lands.

See Map 2. Sahtu Settlement Lands.

Map 2. Sahtu Settlement Lands

1.1.3 Local Leadership

The SSA is divided into 3 Districts. Within these 3 Districts are located the 5 Sahtu communities:

- K'asho Got'ine District (Colville Lake and Fort Good Hope),
- Déline District (Déline), and
- Tulita District (Tulita and Norman Wells).

The local Band Councils and regional Sahtu Dene Council are the political bodies responsible for matters relating to the treaty and the Indian Act. The Band Councils play an important leadership role in determining community priorities and they administer social programs. The Sahtu Dene Council makes decisions on issues that influence how business is conducted in the Sahtu and provides advice to the Sahtu Secretariat Incorporated (SSI).

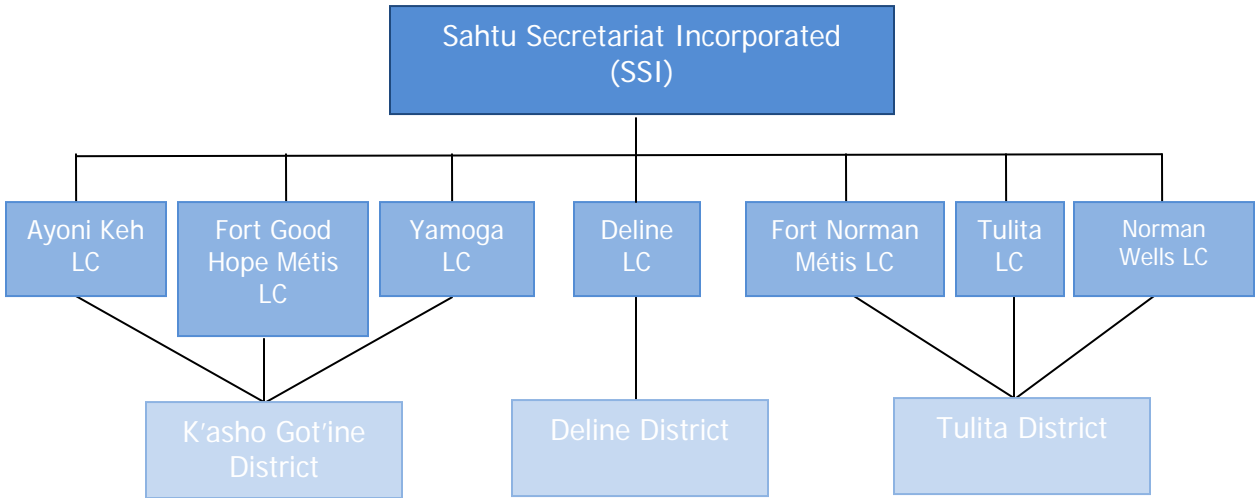
1.1.4 The Sahtu Secretariat Incorporated (SSI)

The Sahtu Secretariat Incorporated (SSI) is the coordinating body for all land corporations. The SSI and land corporations are responsible for: 1) holding the land in trust for beneficiaries and 2) managing the Land Claim funds. Each District has its respective land corporations, as listed in Figure 2.

The SSI's mandate is to ensure that the implementation of programs and services under the Sahtu Dene and Métis Comprehensive Land Claim Agreement (SDMCLCA) benefits the people of the Sahtu. The SSI is the main contact for federal and territorial governments with respect to education, health, environment and economic development.

The three approving parties of the Sahtu Land Use Plan (from here on referred to as the Plan or the SLUP), are the SSI, the Territorial, and the Federal Governments.

Figure 2. SSI and the Land Corporations



1.2 THE PEOPLE

1.2.1 The Sahtu Dene and Métis²

The Sahtu Settlement Area (SSA) is the homeland of the Sahtu Dene and Métis. The Sahtu Dene have occupied the area for thousands of years. The Sahtu Métis have descended from intermarriage between Sahtu Dene and Euro-Canadians who began to move into the region with the fur trade in the early nineteenth century.

The Sahtu Dene traditionally organized themselves into four major cultural groups the:

- K'asho Got'ine (Big Willow People),
- Shuta Got'ine (Mountain People),
- Sahtugot'ine (Great Bear Lake People), and
- K'áálo Got'ine (Willow Lake People).

The regional bands share a common culture but differences occur in the dialects, practices, stories, cultural heroes, and places used by each group.³

See Map 3. Traditional Cultural Groups of the Sahtu Settlement Area.

1.2.2 Sahtu Communities⁴

There are five communities in the Sahtu Settlement Area:

- K'abami Tué - Colville Lake,
- Radilih Koe - Fort Good Hope,
- Le Gohlini - Norman Wells,
- Tulita, and
- Déline.

K'abami Tué, Colville Lake

K'abami Tué, "Ptarmigan Net Lake" or Colville Lake is the smallest and most remote community. It was originally an outpost camp where a few families established their homes. It is home to the Behdzi Ahda First Nation. It was and continues to be an important fish lake and trapping area.⁵

Colville Lake remained one of the more isolated communities in the western Arctic until the turn of the 21st Century. Today a winter road connects it to Fort Good Hope, Norman Wells, Yellowknife, and to other southern communities. Significant natural gas reserves were recently discovered in the area suggesting a future with increased economic opportunities.⁶

² Prepared by The Sahtu Heritage Places and Sites Joint Working Group. January 2000 (2nd Edition).

"Rakekée Gok'é Godi: Places We Take Care Of. Written by Tom Andrews.

³ *ibid*

⁴ Excerpted from, The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada's Northwest Territories, 2005, Sahtu GIS Project

⁵ *ibid*

⁶ *ibid*

Map 3. Traditional Cultural Groups of the Sahtu Settlement Area

Radilih Koe, Fort Good Hope

Radilih Koe, “home at the rapids” or Fort Good Hope, is 27 km south of the Arctic Circle, located below Fee Yee, the Ramparts Rapids. Fee Yee is an ancient fishery and spiritual site.

Fort Good Hope was established in 1805 as the first fur trading post in the lower Mackenzie. It became a place of gathering and trade for the Shuta Got’ine, Gwich’in, and Inuvialuit of the Mackenzie Delta. The town was relocated several times but it returned to its original site where it remains today, on the eastern shore of the Mackenzie River.⁷

Le Gohlini, Norman Wells

Le Gohlini, “where the oil is” or Norman Wells was established in 1921 due to oil deposits. The existence of oil seepages was known to the Dene passing through the area but the first well was drilled in 1919.

In the mid-1980s a pipeline was completed to Zama, Alberta. Norman Wells became a regional centre with jet service north and south. A number of regional government offices and skilled, high wage jobs are available in town. Oil reserves are now in decline but adventure tourism and development of oil and gas in other regions are creating new opportunities.⁸ Norman Wells is the largest and least traditional community of the Sahtu.

Tulita

Tulita, formerly Fort Norman, means “where the waters meet.” The name refers to the meeting of Sahtu Deh, Bear River’s clear waters with the muddy waters of the Dehcho, the Mackenzie River. People would camp at Tulita to hunt for caribou and more rarely, muskoxen.

Tulita was established in 1810 by the North West Company. The community was relocated several times but as in the case of Fort Good Hope, it returned to its original location in 1851, where it remains today. Tulita is also situated within an oil-rich area.

Déline

Déline, “where the water flows”, is located on the west end of Keith Arm of Great Bear Lake. The current location was established around Prophet Ayha’s residence, a well-known and well-respected man whose prophecies are largely regarded as being realised in the present day. In 1825 Franklin and his crew also established a staging area and winter quarters in Déline’s current location.

“The people of Déline refer to themselves as “Sahtugot’ine”, “the people of the Sahtu”. The Sahtugot’ine see themselves as part of the lake as they see evidence of their ancestors all around. The lake is part of their culture and way of life and they consider themselves stewards of the lake. They are the only community on Great Bear Lake which has sustained them since

⁷ Excerpted from, The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada’s Northwest Territories, 2005, Sahtu GIS Project, P.19

⁸ Excerpted from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada’s Northwest Territories, 2005, Sahtu GIS Project, P.25

time immemorial. The lake and its watershed play a central role in the cosmology, history and traditional law, and in the elders' transmission of culture to younger generations."⁹

1.2.3 Statistical Overview of the Sahtu¹⁰

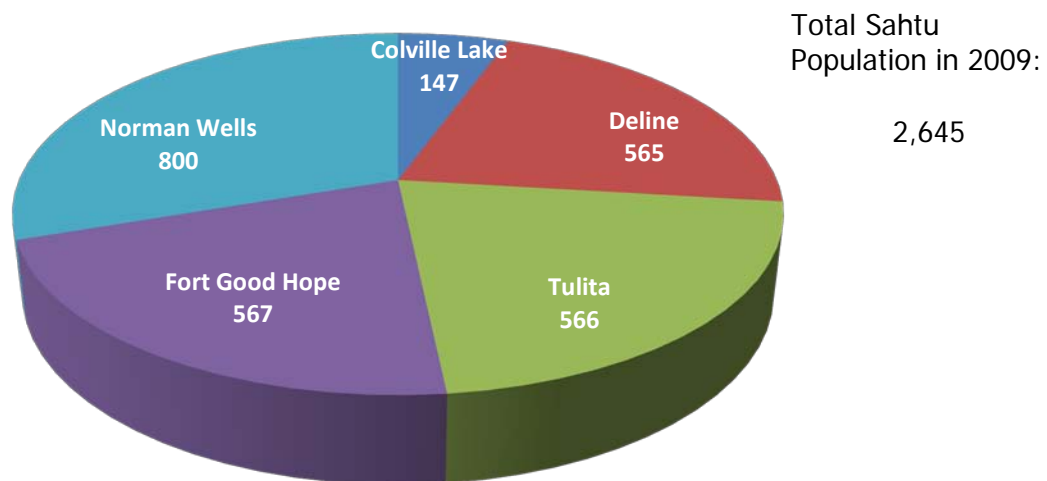
The information below was provided to the Sahtu Land Use Planning Board by the NWT Bureau of Statistics. All figures and statistics are taken from *Northwest Territories: Sahtu Regional Summary* (February 2010), NWT Bureau of Statistics. For more detail, please download the full report from the Sahtu Land Use Planning Board website: www.sahtulanduseplan.org or contact the NWT Bureau of Statistics: <http://www.stats.gov.nt.ca/contacts/index.html>.

The Sahtu region accounts for 6% of the NWT's population and 5% of its income. Norman Wells is the commercial and administrative centre, serves as the regional hub, and is the region's primary service and supply centre. It has the highest average level of income in the NWT.¹¹

Population

The population of the Sahtu in 2009 as reported by the GNWT Bureau of Statistics was 2,645, 6.1% of the total NWT population. The population consists of 24% of residents under the age of 15 and 10% that are 60 years of age or older.

Figure 3. Sahtu Population in 2009



Source: NWT Bureau of Statistics (February 2010)

⁹ Great Bear Lake Working Group. May 31, 2005. "The Water Heart": A Management Plan for Great Bear Lake and its Watershed. Directed by the Great Bear Lake Working Group and facilitated and drafted by Tom Nesbitt.

¹⁰ *Northwest Territories: Sahtu Regional Summary*, (February 2010), NWT Bureau of Statistics

¹¹ The Sahtu Region, Regional Profile, ITI, GNWT: <http://www.iti.gov.nt.ca/about-iti/sahtu/profile.shtml>

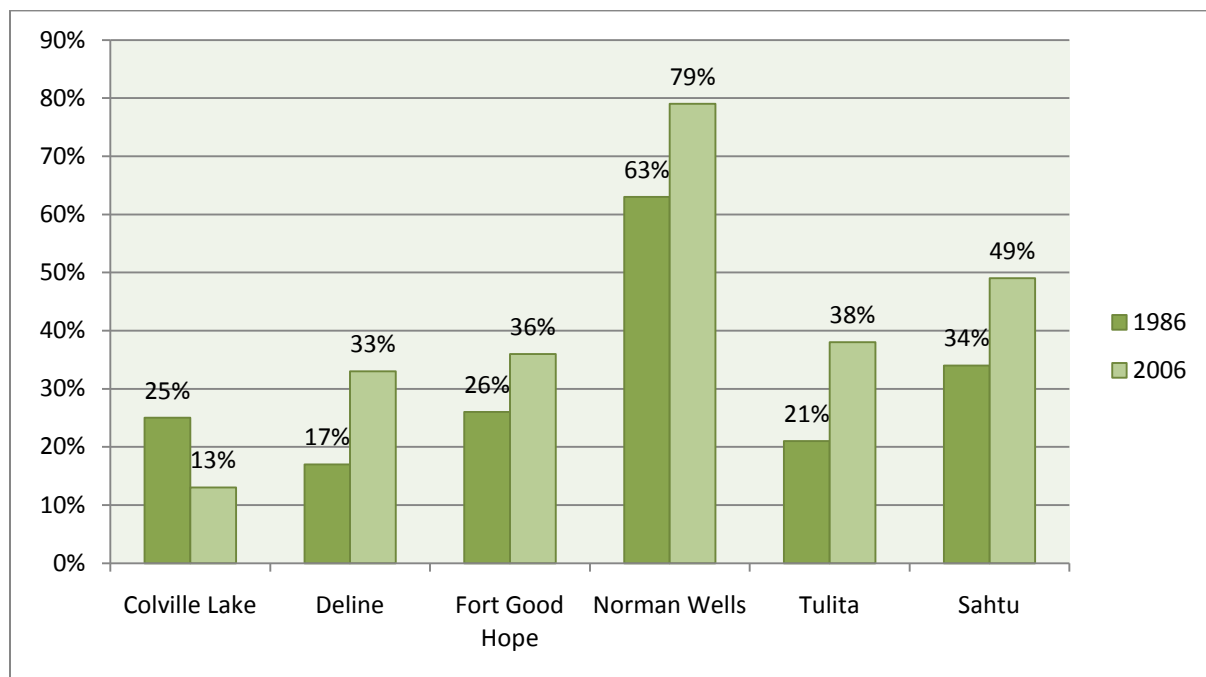
The Sahtu population is 75% Aboriginal. The communities of Colville Lake, Déline, Fort Good Hope, and Tulita have similar ethnicity proportions with 89% of the population or higher that is of Aboriginal descent. In Norman Wells, 40% of the population is Aboriginal and 50% of the NWT population is Aboriginal.

The proportion of people under the age of 15 decreased from 34% in 1996 to 24% in 2009. The proportion of people over 60 years or over doubled between 1996 and 2009. The population of the Sahtu is projected to grow by 4.5% by 2019.

Education

According to Statistics Canada, education levels in the Sahtu increased considerably between 1986 and 2006, but they remain significantly below NWT levels. In 2006, less than 50% of people in the Sahtu had a high school diploma or more education whereas 67% of the NWT population had a high school diploma or more education. Despite this, the levels of education in the Sahtu have been increasing since 1986.

Figure 4. People with a High School Diploma or More Education from 1986 to 2006



Source: Statistics Canada¹²

¹² Note: Statistics Canada employs a random rounding technique for confidentiality that may result in excess variations in the data for very small communities.

Labour Force Activity

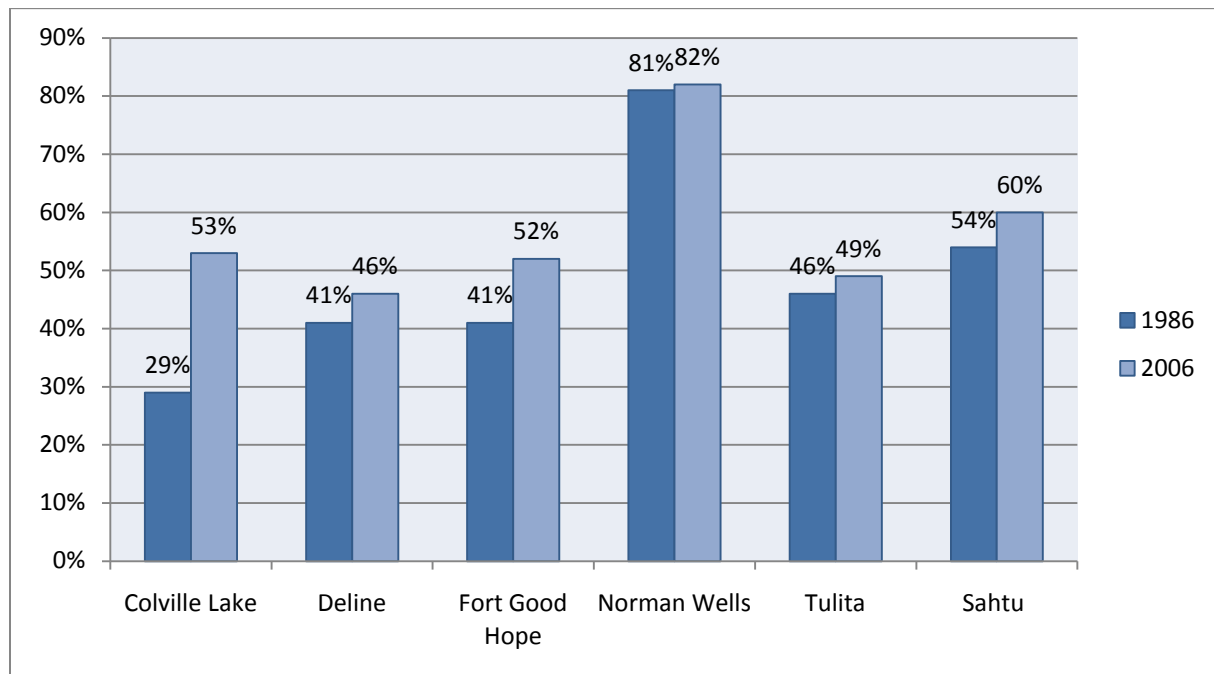
The employment rate in the Sahtu rose from 53.8% in 1986 to 59.8% in 2006, primarily due to significant increases in employment in Colville Lake and Fort Good Hope. Employment rates in Norman Wells have remained relatively steady over the same period.

The Sahtu is the only region in the NWT where the employment rate is higher for women (60%) than it is for men (58%). The rate for non-Aboriginal people in the Sahtu is 88% compared to 50% for Aboriginal people.

The employment rate for persons in the Sahtu with a high school diploma or more was 83% compared to an employment rate of 37% for those without a high school diploma. Compared to the rest of the NWT, the Sahtu region had the largest gap in employment rates between people with a high school diploma or higher and those with less education.

In 2009, the graduation rate in the Sahtu was 33% compared to the NWT graduation rate of 53%.

Figure 5. Employment Rate in 1986 and 2006

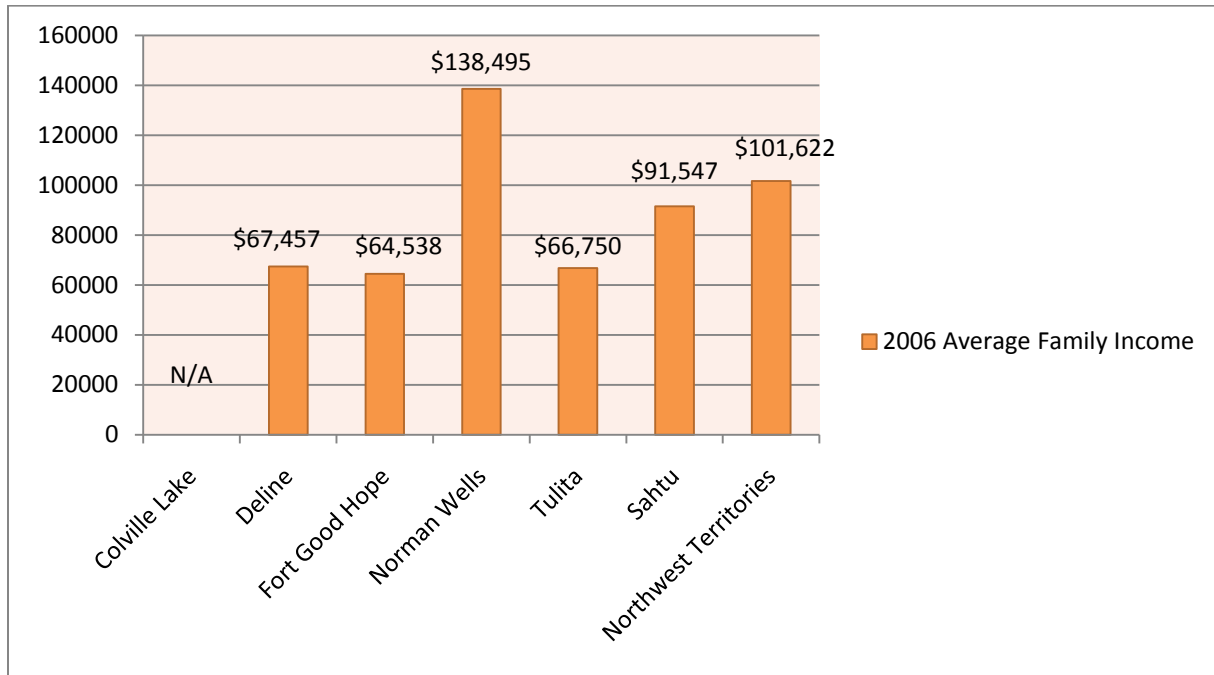


Source: Statistics Canada

Income

In 2006, the average family income in the Sahtu was \$91,547. The NWT's average income for the same period was \$102,622. In 2006, 18% of families had incomes less than \$25,000. In Norman Wells, only 10% of families had incomes less than \$25,000.

Figure 6. Average Family Income in 2006



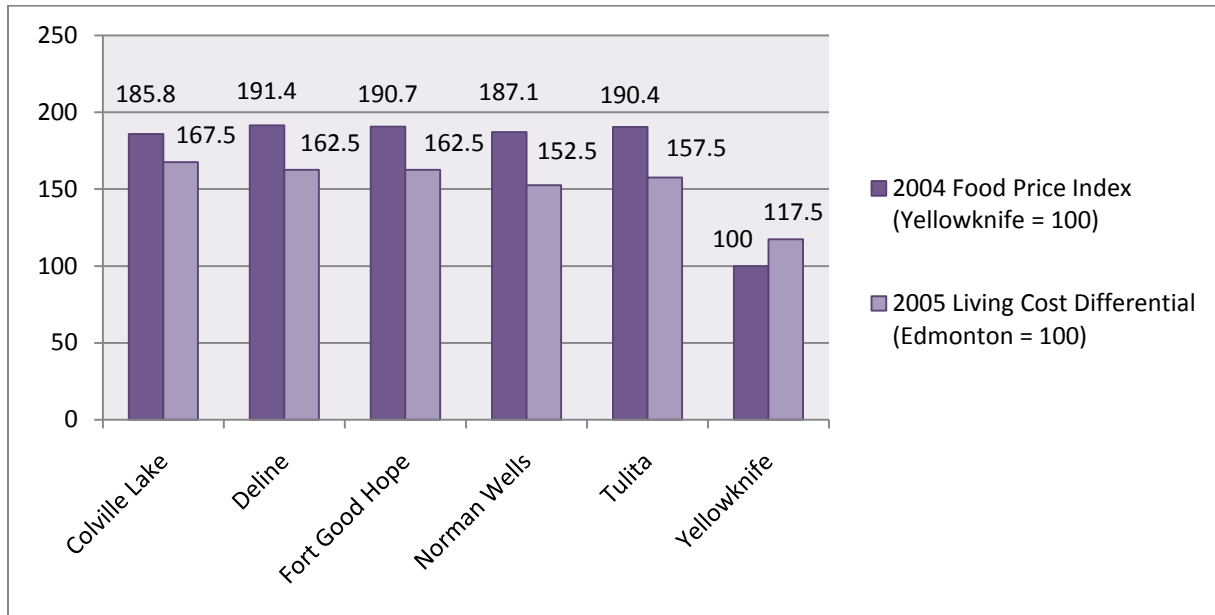
Source: Statistics Canada

Cost of Living

Yellowknife is used as a baseline for the food price index in 2004. The living cost differential refers to the cost of a basket of goods in the NWT communities compared to the cost of a basket of the same goods in Edmonton (Edmonton = 100). The living cost differential includes a variety of products and services such as food and transportation but it does not include shelter costs.

In 2004, Deline had the highest food costs of the Sahtu, 91% higher than Yellowknife. The communities experienced food costs 85.8%-91.4% higher than those in Yellowknife. All five Sahtu communities had living cost differentials 30% or higher than Yellowknife.

Figure 7. Food Price Index in 2004 and Living Cost Differential in 2005



Source of 2004 Food Price Index: NWT Bureau of Statistics

Source of 2005 Living Cost Differential: Statistics Canada

Housing

The Sahtu is above the NWT average in terms of housing problems. Just over 50% of the total households have suitability, adequacy and/or affordability problems compared to 32% in the NWT.

The NWT Bureau of Statistics defines the terms as follows:

Suitability: appropriate number of bedrooms for the number of occupants

Adequacy: running water, an indoor toilet, proper plumbing and no need for major repairs

Affordability: housing costs are less than 30% of the household income

The percentage of households in the Sahtu with housing problems increased from 39% in 2000 to 51% in 2009.

1.3 CULTURE

This land is our source of survival. Our grandfathers, our fathers, and we the elders of today have all strived on the land. I myself have been committed to living on the land. So when we speak of the land, we speak nothing but the truth. It is as if we are speaking of our own hearts.

The land is very important to us. Not only do we dwell on it but also the wildlife survives on it. As humans, we survive by eating the wildlife. That ... is a way of life.¹³

"Rakekée Gok'é Godi: Places We Take Care Of", A Report by the Sahtu Heritage Places and Sites Joint Working Group (December 1999), is an important resource on Sahtu Dene and Métis culture. The bulk of the information below is referenced from this report¹⁴. Excerpts from "The Water Heart": A Management Plan for Great Bear Lake and Its Watershed (2005) are also included.¹⁵

Traditional Dene life followed the changing seasons and movement of wildlife. The Dene developed knowledge of the land and the ability to survive in harsh climates. With the coming of the fur traders, the Dene world changed. Understanding this history is critical to understanding the Peoples' connection to the land and their views on land management.

The history of the Métis falls within the more recent past. In the early days of the fur trade the Métis played prominent roles in the local economy as entrepreneurs and interpreters, and were ambassadors to both cultures. Many places throughout the Sahtu Settlement Area are important to both the Dene and the Métis for their history and culture.¹⁶

The Sahtu Dene and Métis identify their language as the Dene language. For the non-Dene and non-Métis the language is often referred to as North Slavey.

1.3.1 Traditional Knowledge (TK)

Traditional knowledge (TK) is an evolving body of knowledge, values, beliefs, practices, customs, and understandings about the environment and about the relationship of living beings with one another and the environment.¹⁷

¹³ From Sahtu Land Use Planning Board – Building a Vision for the Land, 1999

¹⁴ Prepared by The Sahtu Heritage Places and Sites Joint Working Group. January 2000 (2nd Edition). "Rakekée Gok'é Godi: Places We Take Care Of. Written by Tom Andrews.

¹⁵ Great Bear Lake Working Group. May 31, 2005. "The Water Heart": A Management Plan for Great Bear Lake and its Watershed. Directed by the Great Bear Lake Working Group and facilitated and drafted by Tom Nesbitt.

¹⁶ Excerpted from P.22, Prepared by The Sahtu Heritage Places and Sites Joint Working Group. January 2000 (2nd Edition). "Rakekée Gok'é Godi: Places We Take Care Of. Written by Tom Andrews.

¹⁷ 2004, Traditional Knowledge Policy, Gwich'in Tribal Council

Traditional knowledge is rooted in the traditional way of life of first nations and is passed down orally, through observations, personal experiences and spiritual teachings. The Dene culture has traditionally defined itself largely in terms of its relationship with the land and the Creator. To the elders, people are not separate from the land. Rather, we are part of it.¹⁸

Tradition and culture are passed on orally and through activities on the land. Culture is passed on through careful observation of, and learning from the land. Spiritual and ethical values, traditional law, codes of behaviour, and stories are learned this way as are knowledge of wildlife behaviour and of the natural environment.¹⁹

Traditional ecological knowledge is based on generations of careful observation of the used environment and its seasonal and yearly variations: knowledge of local micro-climates, ice and snow, river currents, plant communities, and animal movements and behaviour, etc. Through this body of knowledge, the Dene and Métis survived in a very harsh environment.²⁰

Traditional knowledge includes more than knowledge about the environment. It is also knowledge about the use and management of the environment and values about the environment.²¹ Traditional knowledge has been developed and refined over long periods of time and then passed on through many generations. Elders are the primary custodians and teachers in this oral culture which is ideally learned on the land. Many stories are associated with specific places and are told on or near the location.²²

For example, TK includes knowledge of the local environment and seasonal distribution of food sources. This includes understanding wildlife behaviour and the cultural rules that govern human interactions with wildlife. These rules include a hunter's interactions with wildlife from the harvesting to preparing phases, established to show respect to the animal. TK also involves social norms such as sharing customs, kinship rules, rules for social interactions and social values, all of which help sustain life and maintain the Sahtu Dene and Métis identity.²³

TK is not only knowledge. It can be compared to a worldview that includes customs, practices, principles and ethical standards that governs the way a person understands the world and lives in it.²⁴ In Dene culture the land fulfills many of the functions of libraries, schools, universities and spiritual places in most western cultures. It is the place where much of culture is learned. It is the sustainer of all life and it is sacred. Human beings are regarded as having responsibilities towards the land. Given the extent of current-day human impacts on the land, elders assert that we are now even more responsible for maintaining its ecological integrity.²⁵

¹⁸ From S. 6.2, P. 81 of 104, Great Bear Lake Working Group. May 31, 2005. "The Water Heart": A Management Plan for Great Bear Lake and its Watershed. Directed by the Great Bear Lake Working Group and facilitated and drafted by Tom Nesbitt.

¹⁹ *ibid*

²⁰ *ibid*

²¹ 2005, Guidelines for Incorporating Traditional Knowledge in Environmental Impact Assessment, MVEIRB

²² *ibid*

²³ Prepared by The Sahtu Heritage Places and Sites Joint Working Group. January 2000 (2nd Edition). "Rakekée Gok'é Godi: Places We Take Care Of. Written by Tom Andrews.

²⁴ 2004, Dehcho First Nation Traditional Knowledge Research Protocol, Gargan, Samuel

²⁵ *ibid*

Cultural Mapping Projects

A number of reports published over the years have contributed to mapping the footprint of Aboriginal groups over the Sahtu Settlement Area (SSA). Traditional Knowledge (TK), traditional place names and archaeological sites are just a few ways to visually represent the extent of the Aboriginal presence, occupancy and use on the land. Some examples of the sources used by the Sahtu Land Use Planning Board (SLUPB) are cited in Table 2. Examples of TK and Sources of Cultural Information.

Table 2. Examples of TK and Sources of Cultural Information

Traditional Knowledge Projects	Description
Dene Mapping Project	Traditional place names were mapped in a project headed by anthropologist Michael Asch at the University of Alberta in the 1970-1980s
Fort Good Hope Chevron TK Report	Completed from 1986-1990 Part of a joint venture agreement (Chevron and FGH) to identify sensitive areas to be avoided
Indian and Northern Affairs Canada (INAC) TK Project	In 1992-93 INAC conducted an extensive mapping project to identify a wide variety of TK values in the SSA: cabins, burial sites, archaeological sites, etc.
Prince of Wales Northern Heritage Centre Archaeological Data	Prince of Wales promotes the preservation and documentation of archaeological heritage and cultural sites significant to the Northwest Territories The Centre records locations of archaeological sites
SLUPB Current Trails Mapping	Conducted from Sept 1999 to June 2000 186 people interviewed in 5 Sahtu communities (for trails and resource harvesting mapping)
SLUPB Mapping our Future Report	Conducted from April-May 2001 108 people interviewed individually 155 participated in workshops 15% of Sahtu residents were interviewed to identify special places for protection
SLUPB Resource Harvesting Mapping	Conducted from June to Nov 2000 186 people interviewed in 5 Sahtu communities (for resident harvesting sites and current trails mapping)
Tulita TK Report	Developed for the Tulita Forest Land Management Plan to document traditional land use knowledge and practices

These projects and maps are not comprehensive. They are intended to reflect cultural values on the land. In considering them, it is important to remember that only a fraction of traditional land uses have been recorded and/or mapped. A low representation of cultural values in an area does not necessarily reflect low use and may in some cases simply reflect gaps in our records. People continue to build cabins, set trap lines and it is generally accepted that due to their high occurrence, the large majority of archaeological sites have yet to be identified in mapping projects. The SLUPB strongly advises proponents to contact the local land corporations, elders councils, TK holders, and charter communities to carry out TK projects before they start work.

Map 4. Significant Cultural Sites

Traditional Trails and Traditional Place Names

The Sahtu Dene and Métis landscape is intimately known to elders. The Sahtu people's network of traditional use trails covers a land use area of over 300,000 km².²⁶ Traditional place names and their associated stories link thousands of locations together and create a narrative of the land. This helps to pass down knowledge of the land, from one generation to the next. Traditional place names tie the Sahtu Dene and Métis people to their culture and to the land.

Traditional trails do more than provide access to harvesting areas. Associated stories are a record of land use over time and can be the focus of activities, stories, rituals and teachings that provide potential for understanding Sahtu and Dene Métis culture and history.²⁷

The Sahtu Dene and Métis are undertaking various initiatives to reclaim their culture and rename the land. The Plan will advance these efforts by using Dene words and place names to describe the land and the people where they are available. The Board will work to replace English words and concepts with Dene language as planning progresses and traditional place names are given to the Board. The current Traditional Place Names Map has not been revised since Draft 2 but the Board recognizes that more work needs to be done in order to accurately reflect local history through traditional names.

Map 4. Significant Cultural Sites shows traditional Sahtu Dene and Métis trails, many of which extend beyond the Sahtu boundary and connect with other major routes of the north.

See Map 5. Sahtu Dene and Métis Traditional Trails.

See Map 6. Traditional Place Names.

1.3.2 Sahtu Dene and Métis Spirituality

Sahtu Dene history is divided into two great time periods: the time of the "Old World", when animals and humans could change form and lived together, succeeded by the "New World", when animals and humans took their final form. We are living in the New World today where people and animals live in harmony, abiding by rules of mutual respect and conduct. These rules guide hunters to respect the animals that give themselves for food.²⁸

The land is also a living thing, inhabited by entities or 'powers', both benevolent and malevolent. While travelling across the land it is important to make votive offerings to the entities and to observe strict rules of behaviour. Offerings may be anything of value such as matches, tobacco, ammunition, or a few coins.²⁹

²⁶ Excerpted P.16 Prepared by The Sahtu Heritage Places and Sites Joint Working Group. January 2000 (2nd Edition). "Rakekée Gok'é Godi: Places We Take Care Of. Written by Tom Andrews.

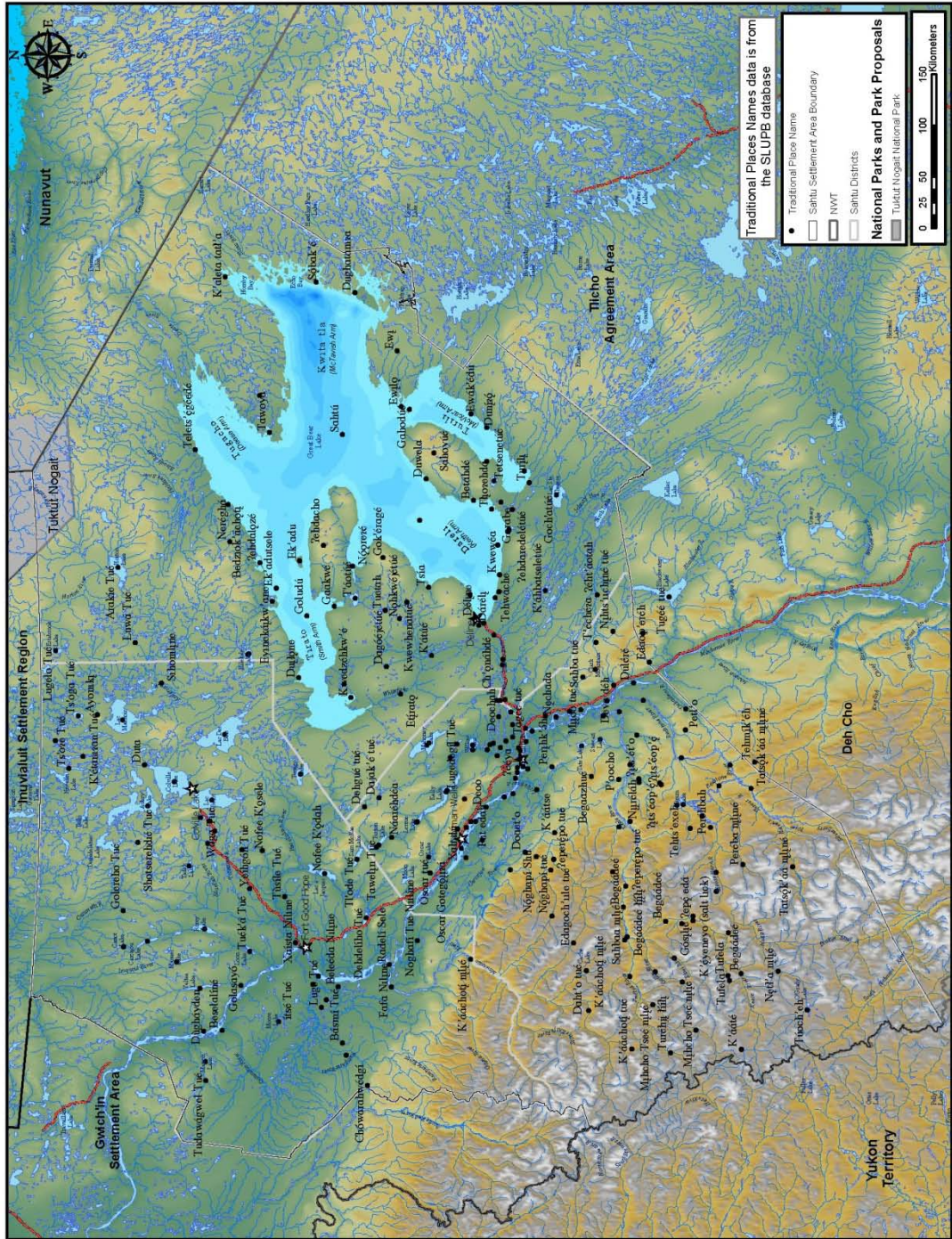
²⁷ Prepared by The Sahtu Heritage Places and Sites Joint Working Group. January 2000 (2nd Edition). "Rakekée Gok'é Godi: Places We Take Care Of. Written by Tom Andrews.

²⁸ Ibid, P. 18

²⁹ Ibid, P.18

Map 5. Sahtu Dene and Métis Traditional Trails

Map 6. Traditional Place Names



Powerful and Significant Places

There are places where powerful entities reside, important events have taken place, or cultural legends are associated with specific landscape features. These places are powerful and significant due to their special conditions. Such places are often prominent landmarks. Special rules must be respected while travelling in these areas.

For example, a giant sheep inhabits Drum Lake. Travellers are cautioned to cross the lake only at specific locations. Doing otherwise would disturb the giant sheep, causing it to rise and create a whirlpool that might endanger the travellers. Many such places are found throughout Sahtu Dene and Métis lands.³⁰

Burial Sites

Burials are sacred places that are given great respect. Since the coming of Christianity, graves have been surrounded by fences. When travellers encounter a burial, it is customary to repair grave fences, clear vegetation from the surfaces of graves and leave offerings such as tobacco or other gifts. At times a fire-feeding ceremony is performed near the graves of prominent individuals. Food is ceremonially given to a fire in honour of the dead. In return people ask their ancestors for good weather, safe travelling conditions and success in hunting.³¹

1.3.3 Youth and the Land

In Sahtugot'ine tradition, grandparents often played a central role in the upbringing and education of their grandchildren. Many years ago, when the time was right, one such grandfather took up the teaching of his grandson. His words "made a path" or "life-long road" for his grandson, which would allow his grandson to "see his gray hair at the end of his road". He taught his grandson of the universal law of the connectedness of all things, of respect for all things, and of the challenges that he would face along his particular road.

His grandfather also tied moose hide bracelets around the wrists and ankles of his grandson and instructed his grandson not to disturb the bracelets, to leave them on until they disintegrated and fell off naturally, and to inform him as they fell off. And he instructed his grandson to pay close attention to his dreams.

Thereafter, the grandson began dreaming of the moose. He developed a "mystical tie" to the moose, a tie that was to endure and develop for the rest of his life. After some time, his left ankle bracelet fell off. Later his right wrist bracelet fell off, and later again his right ankle and his left wrist bracelets each fell off in turn. When he informed his grandfather that the final bracelet had fallen off, of the order of their falling off and of his dreams, his grandfather was assured of the unity of his person and his relationship with the land. He declared

³⁰ Ibid, P.18

³¹ Ibid, P.18

*his grandson sufficiently mature that he was now an adult and could establish his own household and home.*³²

Elders say that young people must try to understand the meanings of stories through their own experience, noting that this encourages independent thinking and provides for a strong future for the youth. The land teaches the young their identity, their history and the rules of their society. Experience on the land is a path to acquiring knowledge.³³

When families travel on the trails that cross the Sahtu landscape, children are told the place names and their associated stories. As these stories are passed on, places become aids for remembering the vast oral tradition in which Sahtu Dene and Métis culture is rooted.

1.3.4 Ongoing Relationship with the Land

Though the majority of Sahtu heritage places and sites deal with the past, modern events are used to pass knowledge on to younger generations. Sites of recent disaster or places where cultural rules have been broken become the heritage places of later generations.

For example, Nôfee Kôselee was the site of a tragic drowning in the 1920s which claimed the lives of an entire family. It is now used to instruct young people about safe travel over ice. In the 1940s two trappers at Beshode Tué were fixated on trapping and as a result endangered the lives of their families, bringing starvation and death. Today the story is used to instruct young people on the appropriate rules for trapping and caring for a family.

Research and monitoring are a fundamental part of the culture. In Déline middle-aged and elder Sahtugot'ine tell a story. When they were younger, their elders gradually passed on to them the accumulated knowledge of the Sahtugot'ine. They also instructed them to observe, take note and be aware of every aspect of their surroundings: of the particular features of places; changing relationships among weather, snow, ice, currents, plants and animals; of the cycles and features of plants and the seasons; and of the particular movements and behaviour of mammals, fish and birds, etc.

Later in life when they found themselves outside the normal realm of their experience and in real danger, the teachings of their elders and the years of observation allowed them to respond with understanding and skill and to survive. As a result, the Sahtugot'ine (People of Déline) insist that the responsibility of research and monitoring should be more community based in order to benefit from the knowledge that people have of the land, to increase involvement and training opportunities for the Sahtu Dene and Métis in development projects. It would also be a way to integrate both traditional knowledge and scientific understanding of the land. The Sahtu Dene and Métis maintain an active relationship with the landscape - one that is ever changing and growing. The relationship is not a static part of history but is living and ongoing.³⁴

³² Charlie Neyelle, excerpted from P. 80 of 104 of the Great Bear Lake Working Group. May 31, 2005. "The Water Heart": A Management Plan for Great Bear Lake and its Watershed. Directed by the Great Bear Lake Working Group and facilitated and drafted by Tom Nesbitt.

³³ Excerpted P.20, Prepared by The Sahtu Heritage Places and Sites Joint Working Group. January 2000 (2nd Edition). "Rakekée Gok'é Godi: Places We Take Care Of. Written by Tom Andrews.

³⁴ Ibid, P.21

1.4 RAKEKÉE GOK'É GODI: PLACES WE TAKE CARE OF

"Rakekée Gok'É Godi: Places We Take Care Of, Report of the Sahtu Heritage Places and Sites Joint Working Group" (December 1999), is a foundation document and was extensively used in the development of the Sahtu Land Use Plan (the Plan). The Working Group was established under S.26.4 of the SDMCLCA to identify culturally significant sites in the Sahtu Settlement Area (SSA) and make recommendations regarding their protection.

The Sahtu Heritage Places and Sites Joint Working Group made a number of recommendations to protect the heritage and cultural sites in the region. The report listed a total of forty sites, the bulk of which have been given some level of protection under the Plan. Map 7. Heritage Sites from "Places We Take Care Of" shows the location of the cultural sites identified in the Rakekée Gok'É Godi: Places We Take Care Of report.

See Map 7. Heritage Sites from "Places We Take Care Of".

Table 3. Sahtu Land Use Plan Zone Designations identifies the zone designation in the Plan for each of the forty heritage sites described in the report. Some sites may have multiple designations if they overlap with more than one of the Plan's zones.

The third column of Table 3 corresponds to the zoning for each of the special places. The acronyms used are further explained in Chapter 4 of the Plan. Only places that are located in Sahtu Settlement Area are included in the table.

Table 3. Sahtu Land Use Plan Zone Designations

Zone	Description
General Use Zone (GUZ)	Development subject to the General Use Terms of the Plan (see Chapter 4 of the Plan)
Special Management Zone (SMZ)	Development subject to the General Use Terms of the Plan AND Subject to the Special Management Terms of the Plan (see both in Chapter 4 of the Plan)
Conservation Zone (CZ)	Development prohibited as per terms of the Plan (Chapter 4)
Proposed Conservation Initiative (PCI)	Development prohibited once areas complete the PAS process and will follow its terms (until PCIs are complete, see Chapter 4 of the Plan)

Table 4. SLUP Zone Designations of Sahtu Heritage Sites in “Places We Take Care Of”

Dene Name	English Name	Zone (GUZ, SMZ, CZ, or PCI)
Fee Yee	The Ramparts	SMZ
Saoyú-?ehdacho	Scented Grass Hills and Grizzly Bear Mountain	Not subject to Plan
Tli Dehdele Dídlo	Red Dog Mountain	CZ
Déline	Déline Fishery & Sir John Franklin's Wintering Quarters	SMZ
Sihoniline ?ehtene	Loon River and Fort Anderson Trail	SMZ
Ayoniki	Maunoir Dome	CZ
Beshode Tué	Bull Caribou Lake	GUZ
Duta	“Among the Islands”	GUZ
Fa?fa Nilne	Mountain River	CZ
K’abami Tue Eht’ene	Colville Lake Trail	GUZ
Koigojere Du	Manitou Island	SMZ
Lugewa Tue	Whitefish Lake	CZ
Neyadaln	The Underground River	SMZ
Nofee Koselee	Little Loche Lake	GUZ
Shigago	Little Chicago	SMZ
Shit’a Got’ine	Trail to the Mountains	PCI
T’agan	Section of the Anderson River	CZ
Tashin Tue	Lac des Bois	CZ, GUZ
Ts’ude nilne Tu’eyeta	Ramparts River and Wetlands	PCI
Ts’oga Tue	“White Muskeg Lake”	CZ, GUZ
Yamoga Fee	“Yamoga Rock”	CZ
?iditue Dayida	The Thunderbird Place	PCI
Edaíla	Caribou Point	PCI
Etirato	Whitefish River	CZ
Neregah	North Shore of Great Bear Lake	SMZ
Somba K’e	Port Radium	SMZ
Tuktu Nogart	Tuktut Nogait National Park Reserve	National Park
T’echo cho deh t’a tlaa	Fort Confidence Area	PCI
Turli	Johnny Hoe Fishery	CZ
Yamoria Eht’ene	Yamoria & the Giant Beavers, Bear Lake	SMZ
K’aalo Tue	Willow Lake (Brackett Lake)	CZ
Kwetini?ah	Bear Rock	CZ
Nacha?da	Old Fort Point	SMZ
Shuht’a Got’ine Eht’ene	Mountain Dene Trail to the Mountains	GUZ
Tuwi Tue	Mahoney Lake Massacre Site	CZ
Deh Cho	Mackenzie River	SMZ
Sahtu Deh	Great Bear River	SMZ
Shalee Tue	Kilekale Lake	GUZ

Map 7. Heritage Sites from "Places We Take Care Of"

CHAPTER 2: BIOPHYSICAL ENVIRONMENT

2.1 GEOLOGY³⁵

The geography of a region is controlled by its geological history. This includes glacial history, the type of rock in an area, the age of these rocks, or the physiographic nature of the rock outcroppings. On a large scale, geologists recognize these differences and separate regions into geological 'provinces'.

The Sahtu Settlement Area includes three distinct geological provinces:

- Bear Province (part of the Canadian Shield), with abundant bedrock outcrops;
- Interior Platform (part of the Western Canada sedimentary basin), with few bedrock outcrops; and
- Mackenzie and Selwyn Mountains (part of the Rocky Mountains and North American Cordilleran Orogen) with abundant bedrock outcrops.

This geological diversity also hosts a diverse collection of mineral deposits with a variety of commodities (e.g., copper). Many commodities such as copper occur in all three geological provinces. However, the nature of how the copper occurs, or the other commodities it exists with, is different in each province. Because of this, the types of mineral deposits (or how the copper occurs) in each province is distinctly different, and how one understands and explores for this type of mineralization varies as well.

See Map 8. Geological Provinces

The 3 Geological Provinces

1) Bear Province

The Bear Province is the easternmost geological province in the Sahtu region. It is characterized by extensive bedrock exposures and is part of the Canadian Shield.

Two components include:

- the Great Bear Magmatic Zone, an area mostly of ancient granite and volcanic rocks and
- the slightly younger rocks of the Coppermine Homocline (flat-lying) that overly or cover the Great Bear magmatic zone.

³⁵ Section provided by NWT Geoscience Office, personal communication, Luke Ootes, February 2010

Map 8. Geological Provinces

2) Interior Platform

The Interior Platform is the central geological Province in the Sahtu region. It is younger than the Bear Province and covers it like a blanket. While it has some similar aged rocks as the Mackenzie Mountains, it was not thrust and folded into mountain ranges.

The Interior Platform stretches from the Arctic Ocean through to the central United States. For example, similar rock types can be continually observed in central Saskatchewan and the Sahtu region.

3) Mackenzie and Selwyn Mountains

The Mackenzie and Selwyn Mountains are the northern extent of the Rocky Mountains, part of the Cordilleran Orogen, that stretch from Mexico through to Yukon and NWT. They form the westernmost of the three geological Provinces in the Sahtu region.

Some geological attributes in the Mackenzie Mountains are similar to the Interior Platform. These rocks however have been thrust and folded, then glaciated to form a mountain belt where much bedrock is exposed. This history has also exposed a diversity of geological attributes and mineral prospects and deposits.

2.1.1 Topography

The surface shape and features of the land including general natural relief and human-made features will to a certain extent shape the decisions that are made on the land. The elevation contours of the land and the terrain are show in Map 9. Elevation and Contours.

See Map 9. Elevation and Contours.

2.2 CLIMATE

2.2.1 Temperature

Environment Canada has historic data of temperature normals taken at the Norman Wells station between 1970-2000. Temperatures vary across the Sahtu due to a number of influences. No historic data was available for the other communities.³⁶

³⁶ Environment Canada, National Climate Data and Information Archive, Canadian Climate Normals or Averages 1971-2000: http://climate.weatheroffice.gc.ca/climate_normals/index_e.html

Map 9. Elevation and Contours

Table 5. Canadian Climate Normals from 1970-2000 taken at Norman Wells

Temperature	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Daily Ave. (°C)	-26.5	-24.7	-18.4	-5.8	6.5	15	17	13.8	6.6	-5.3	-19.3	-25.1	-5.5
Daily Max (°C)	-22.6	-20.2	-12.5	0.3	12.3	20.7	22.6	19.2	11.1	-2.1	-15.8	-21.2	-0.7
Daily Min (°C)	-30.4	-29.2	-24.3	-11.9	0.7	9.2	11.3	8.3	1.9	-8.4	-22.9	-28.9	-10.4
Rainfall (mm)	0.2	0	0.1	0.7	13.7	40.4	40.9	40.9	24.9	3.9	0	0.2	166
Snowfall (cm)	21.6	16.9	14.2	13.4	8.1	0.4	0.1	0.7	6.7	26.8	20.8	23.7	153.4
Precipitation (mm)	17	13.6	11.5	11.9	21	40.8	41	41.6	31.2	26.5	16.4	18.2	290.7

Source: Environment Canada's Historic Data 37

Below freezing minimum temperatures are the norm in January. Weak or little sunshine means there is little variation between maximum day and minimum night-time temperatures in January. Temperatures can drop to -40 °C and -50 °C in the winter months.³⁸ Despite the long cold winters the short summers can be warm and usually range from 20°C to mid-30°C with variations across the area.³⁹

Precipitation in the Sahtu is restricted partly because of the rain-shadow effect of the Mackenzie Mountains. Snow and rainfall are low by North American standards. Average precipitation is roughly 300-400 mm annually for the majority of the Sahtu. The eastern side of Great Bear Lake tends to get less. The north-eastern side of the lake gets about 120-200 mm annually and the south-eastern side gets about 201-300 mm annually. Precipitation decreases at the more northern altitudes, tapering off to 250 mm at the northern boundary.⁴⁰

January precipitation is mainly in the form of snow. Across northern Canada the month of April is still winter and precipitation continues to fall as snow. October marks the transition from mainly rain to snowfall. By November precipitation primarily falls as snow. Mean monthly snowfall rises sharply in the autumn and then diminishes through the winter month. Even as snowfall decreases, snow accumulation steadily increases throughout the winter due to lack of significant thaws. Maximum snowpack depth is reached in March then a more rapid decrease in the snow-pack occurs as summer approaches.⁴¹

³⁷ National Climate Data and Information Archive

http://www.climate.weatheroffice.gc.ca/climate_normals/index_e.html

³⁸ The Atlas of Canada <http://atlas.nrcan.gc.ca/site/english/maps/environment/climate/temperature>

³⁹ The Atlas of Canada

http://atlas.nrcan.gc.ca/site/english/maps/environment/climate/temperature/temp_summer

⁴⁰ Ecosystem Classification group. 2007 (rev. 2009). Ecological Regions of Northwest Territories – Taiga Plains. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. Viii + 173 pp. + folded insert map.

⁴¹ Natural Resources Canada, The Atlas of Canada:

<http://atlas.nrcan.gc.ca/auth/english/maps/environment/climate/snowcover/snowdepth>

2.2.2 Permafrost

Permafrost is soil or rocks whose temperature remains at or below the freezing point for a long period of time. Permafrost is made up of many layers. Between the permafrost and the surface is an “active layer” which thaws in summer and freezes in winter.

The “active layer” is unstable. As the ice in the active layer melts it loses volume and the soil above tends to collapse.⁴² This makes it difficult to build roads, airfields, and other public infrastructure. Permafrost does not stop vegetation as plants can still grow above it.

Most of the Sahtu Settlement Area (SSA) lies in extensive discontinuous permafrost (50-90% of area covered in permafrost). Farther north near Fort Good Hope and Colville Lake the permafrost becomes continuous (90-100% of area covered in permafrost).

See Map 10. Permafrost and Treeline.

2.2.3 Climate Change

Climate change is most strongly felt in northern environments. Climate Change has been documented to impact air temperatures, precipitation, and typical weather patterns.⁴³ It can also affect water levels, freeze up and thaw dates, permafrost distribution, and contribute to more extreme weather patterns which in turn may impact growing seasons, biological productivity, and the distribution of plants and wildlife, on which the Sahtu Dene and Métis depend. Higher water levels may also impact communities. As weather patterns change, communities will need to understand the changes and the impacts to be able to adapt accordingly.⁴⁴

Climate Change Impacts and Adaptation in the NWT

In 2008 the Government of the Northwest Territories released the “NWT Climate Change Impacts and Adaptation Report”. The report provides background information on climate change, describes impacts on GNWT activities and speaks to actions that different government departments are taking for adaptation. Immediate risks and longer-term vulnerabilities and challenges are also discussed.

Average circumpolar Arctic temperatures have increased twice as fast as global average surface temperatures which have warmed by about 0.74°C over the last 100 years.⁴⁵ According to the report, the “Mackenzie Valley is a global hot spot for climate change with average annual temperatures increasing about 2°C since the 1940s” when record keeping started.⁴⁶ Further

⁴² Natural Resources Canada, The Canada Atlas:

<http://atlas.nrcan.gc.ca/auth/english/maps/peopleandsociety/nunavut/land/permafrost/1>

⁴³ DRAFT Infrastructure in permafrost: A guide for climate change adaptation. (March 2010). Canadian Standards Association. Plus 4011-10. Courtesy of Environment Canada.

⁴⁴ The Board will look into climate change research further for Draft 3.

⁴⁵ NWT Climate Change Impacts and Adaptation Report. 2008. ENR, GNWT:

http://www.enr.gov.nt.ca/live/documents/documentManagerUpload/NWT_Climate_Change_Impacts_and_Adaptation_Report.pdf

⁴⁶ Ibid, P. 3

Map 10. Permafrost and Treeline

north this increase becomes more pronounced. For example, annual temperatures in Inuvik have increased by 3°C.⁴⁷ "All climate models indicate that climate warming will occur earlier in the Arctic than in other regions and that it will become more pronounced over time."⁴⁸

Computer models were used to determine mean rises in seasonal air temperatures across the Canadian Arctic.⁴⁹ The models calculated projected mean rises in seasonal temperatures. Two situations were modelled. One scenario projected temperatures based on moderate greenhouse gas emissions and the other used a high emission scenario.⁵⁰

The mean rises in seasonal air temperatures in the Sahtu are provided in the Table 6.

Table 6. Mean Rises in Seasonal Air Temperatures in the Sahtu

Year	Latitude 65-70							
	Winter		Spring		Summer		Autumn	
	Moderate	High	Moderate	High	Moderate	High	Moderate	High
2011-2040	1.4	1.8	1.0	1.2	0.5	0.9	1.4	2.1
2041-2070	3.8	4.2	2.5	2.5	1.6	1.7	4.0	4.1
2071-2100	6.6	7.8	3.7	4.7	2.7	3.1	5.3	6.3

Source: DRAFT Infrastructure in permafrost: A guide for climate change adaptation⁵¹

Environment Canada provided a map of warming trends across Canada from 1979 to 2008. The changes in degrees per decade are recorded. Temperatures in the Sahtu were recorded at the Norman Wells weather station.

See Map 11. Warming Trends °C/Decade 1979-2008.

Scientists project that temperatures will continue to rise due to the burning of fossil fuels and other sources of greenhouse gas emissions. In addition to making efforts to reduce its greenhouse gas emissions, the NWT will need to consider adaptation measures in preparation for:

- extreme weather events such as flooding, heatwaves, droughts, etc.;
- increased variability in precipitation;
- glaciers and polar ice sheets melting;
- global sea-level rise;
- ocean-warming;
- changes in species populations and ranges;
- health effects from extreme high temperatures (heart and respiratory problems).⁵²

⁴⁷ Ibid, P. 3

⁴⁸ DRAFT Infrastructure in permafrost: A guide for climate change adaptation. (March 2010). Canadian Standards Association. Plus 4011-10. Courtesy of Environment Canada. P. 13

⁴⁹ ibid

⁵⁰ ibid

⁵¹ Ibid, P. 15-16

⁵² Ibid, P. 5

Map 11. Warming Trends °C/Decade 1979-2008

The Mackenzie Basin Impact Study (MBIS), a six-year collaborative research led by Environment Canada described potential climate change impacts. The MBIS “concluded that lower water levels, thawing permafrost and other problems caused by climate change would offset any potential benefits from future warming” (1997).⁵³

The GNWT will focus future efforts on climate change adaptation measures in order to minimize the impacts felt by northern communities. Although changes are taking place faster than anticipated by scientists, the future effects of climate change are unknown.

In the NWT, climate change impacts are already affecting a number of sectors such as the oil and gas, mining, transportation and construction sectors which all have to address problems resulting from the melting of permafrost. “Design criteria and engineering standards are being revised to adapt to permafrost degradation in a warming climate. Shorter and less dependable winter road seasons have increased the cost and reduced the reliability of transporting goods and materials” into locations that do not have all-weather roads such as the Sahtu.⁵⁴

In March 2007 the GNWT published “Greenhouse Gas Strategy 2007-2011: A Strategy to Control Greenhouse Gas Emissions in the NWT” to address emission reduction in the NWT. The GNWT’s goal is to reduce greenhouse gas (GHG) emissions from its own operations by 10% below 2001 levels by 2011. The Strategy encourages all other sectors to develop their own emission management plans and targets in order to decrease the impacts of climate change.

2.3 WATER AND WATERSHEDS⁵⁵

In March 2007, the 15th Legislative Assembly of the Northwest Territories unanimously passed a Right to Water Motion whereby the Assembly recognized that:

- “all peoples have a fundamental human right to water that must be recognized”;
- “this right includes access to water bodies for purposes of harvesting, travel and navigation”;
- “this right must take precedence over the use of water for industrial and commercial purposes.”

For greater detail see The Right to Water: Motion 20-15(5).⁵⁶

With increasing concern and interest relating to water availability and quality, the GNWT has taken on a number of initiatives, two of which are mentioned below.

⁵³ Ibid, P. 7

⁵⁴ GNWT Greenhouse Gas Strategy – 2007-2011, ENR, P. 2

⁵⁵ Kokelj, Shawne A., Hydrologic Overview of the Gwich'in and Sahtu Settlement Areas, 2001, INAC, Water Resources Division

⁵⁶ The Right to Water: Motion 20-15(5), March 5, 2007, Northwest Territories Hansard Page 1168-9, Excerpted from Northern Voices, DRAFT Northern Waters, NWT Water Stewardship Strategy (November 2009), Government of the Northwest Territories, Environment and Natural Resources: www.enr.gov.nt.ca

2.3.1 Draft NWT Water Stewardship Strategy⁵⁷

In November 2009, The Government of the Northwest Territories (GNWT), Indian and Northern Affairs Canada (INAC), and Aboriginal Governments released Northern Voices, Northern Waters, the Draft NWT Water Stewardship Strategy. The Strategy's vision is that:

"The waters of the NWT will remain clean, abundant and productive for all time."

The draft Strategy recognizes that people rely on water for a number of reasons including transportation, recreation and sustenance, and that water is essential for the physical, cultural, spiritual and economic well-being of the people.

In the words of the Draft Strategy, "Aboriginal people in the NWT have a long and intimate relationship with the land and water. They draw their spiritual and cultural integrity and their strength from the land and water (or ecosystem)."

"Water is a living thing to residents of the NWT. It is not just a commodity, something to be traded or used and thoughtlessly discarded. It brings life and it is life. As residents of the NWT, we have an obligation to protect and steward our water resources for ourselves, for future generations and for all living things that rely on water."

With this in mind, the Draft Strategy is seeking to improve decision-making processes, information sharing, and communication among all parties or water partners involved in water stewardship in the NWT.

The SLUP recognizes that water quality and quantity are important concerns to the people of the Sahtu and have taken this into consideration in its development of the Sahtu Land Use Plan.

2.3.2 Watersheds⁵⁸

Watersheds are areas of land containing a set of streams and rivers that all flow into a single larger body of water, such as a larger river, a lake or an ocean. The Sahtu Region has many water bodies, including rivers, streams, lakes and wetlands. Within the Sahtu Settlement Area 7 major watersheds occur. Within these major watersheds are 25 regional watersheds varying in size from 100 km² to 26,000 km². See Map 12. Major and Regional Watersheds

Two water bodies of significant sizes dominate the Sahtu Settlement Area (SSA) landscape. Great Bear Lake occupies the eastern half of the SSA. The Dehcho (Big River), or Mackenzie River runs through the SSA from the south to the north. Both have provided the original inhabitants of the Sahtu with vital social, cultural and economic resources. Watersheds offer geographical or physiological, rather than political boundaries for the planning process.⁵⁹

⁵⁷ Northern Voices, DRAFT Northern Waters, NWT Water Stewardship Strategy (November 2009), Government of the Northwest Territories, Environment and Natural Resources: www.enr.gov.nt.ca

⁵⁸ Personal Communication, Bob Reid, Water Management Head, INAC Water Resources, January 29, 2010

⁵⁹ Excerpted from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada's Northwest Territories, 2005, Sahtu GIS Project, P.36

Map 12. Major and Regional Watersheds

The Dehcho (Big River) or Mackenzie River⁶⁰

The Mackenzie River system is the largest in Canada and covers about 1.8 million km², about one-fifth of Canada's land-base. Its major tributaries flow from the Rocky Mountains in British Columbia and Alberta to the Mackenzie River in NWT, which empties into the Beaufort Sea. The majority of the streams that flow through the Sahtu are within the Mackenzie River basin. The main tributaries in the Sahtu are the Keele, Carcajou, Mountain, and Great Bear Rivers.

The Mackenzie River drainage basin is made up of six major sub-basins:

- 1) The Peel River basin
- 2) The Great Bear Lake basin
- 3) The Liard River basin
- 4) The Great Slave Lake basin
- 5) The Lake Athabasca – Athabasca River basin
- 6) The Peace River basin

Near the end of its course sediments (sand, silt and clay) are deposited into channels, lakes and sandbars of the Mackenzie Delta which provides vital habitat for many Arctic species. Millions of migrating birds use the Mackenzie River valley as their main migratory route to the delta.⁶¹

The Mackenzie River tends to respond slowly to local rainfall events due to:

- 1) its large catchment size (1,660,000 km² at Tsiigehtchic),
- 2) its many inflows, and
- 3) the storage capacity of its large lakes (Great Bear and Great Slave).

Spring runoff flows can increase quickly during break-up, especially when ice jams release. Large rainstorms in the Liard River Basin can also cause flooding along the Mackenzie River in summer.

Table 7. Mackenzie River Water Quantity⁶²

Months	Time of year	Water quantity
Early May	Spring	Small increase in flow
Late May/ Early June	Spring thaw	Peak flows occur with the melting of winter snow pack The spring thaw initiates ice break up on rivers
June to November	Summer and Fall	Gradual decrease with possible peaks after summer rain storms
November to December	After freeze up	Small decrease in flow with transfer of in-stream water to ice storage
December to April	Late Winter	Gradual decrease in flow, lowest runoff from drainage basins

Source: Hydrologic Overview of the Gwich'in and Sahtu Settlement Area

⁶⁰ Section reference: Kokelj, A. Shawn, Hydrologic Overview of the Gwich'in and Sahtu Settlement Area, December 2001, INAC, Water Resources Division, Yellowknife

⁶¹ Excerpted from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada's Northwest Territories, 2005, Sahtu GIS Project, P.36

⁶² Section reference: Kokelj, A. Shawn, Hydrologic Overview of the Gwich'in and Sahtu Settlement Area, December 2001, INAC, Water Resources Division, Yellowknife

Great Bear Lake (GBL) and Other Tributaries

Great Bear Lake (GBL) sits astride the Arctic Circle and just south of the tree line. It is the largest freshwater lake entirely in Canada and the ninth largest lake in the world, both in terms of surface area (31,326 km²) and volume (2,292 km³). It makes up about 22% of the Great Bear Lake watershed.

The BGL watershed is about 144,069 km². Great Bear Lake has a huge storage capacity and provides a steady flow of water to Great Bear River throughout the year. Although the flow of water is relatively steady, it peaks about mid-August then decreases gradually until late April.⁶³

The Great Bear Lake Watershed extends into surrounding areas in the Nunavut, the Deh Cho and particularly in the Tlicho (Wek'eezhii) settlement areas.

Table 8. Great Bear Lake Watershed Break-Down⁶⁴

Location	Proportion of Watershed	Total Area
Sahtu	63%	90,267 km ²
Tlicho	31%	44,525 km ²
Deh Cho	4%	6,401 km ²
Nunavut	2%	2,876 km ²
Total	100%	144,069 km²

Source: "The Water Heart": A Management Plan for Great Bear Lake and its Watershed, 2005 65

Major Tributaries

The Johnny Hoe River lies partly in the Sahtu and flows north into Great Bear Lake. Its drainage basin is 17,300km². Its flow is not stored by large lakes but is characterised by spring runoff and followed by a relatively quick return to low flows.

The Camsell River with a basin area of 31,100km² also flows northward into Great Bear Lake from the Tli Cho area. The Camsell River has lake storage throughout its drainage basin and has a relatively stable flow throughout the year.

The Mountain and Keele Rivers have peak flows during June and August. These river basins have little storage capacity because of the steep bedrock topography. As a result, their stream water levels fluctuate quickly during spring melt and with summer rainfall events.

The Sahtu has a diverse landscape which creates a variety of hydrological conditions. Spring snowmelt is the main source of water for most streams which means that peak flows are during the springtime. The tributaries flowing from the mountains to the west of the Mackenzie River are also significantly influenced by precipitation during the summer, mostly because the

⁶³ Section reference: Kokelj, A. Shawn, Hydrologic Overview of the Gwich'in and Sahtu Settlement Area, December 2001, INAC, Water Resources Division, Yellowknife

⁶⁴ Great Bear Lake Working Group. Maqy 31, 2005. "The Water Heat": A Management Plan for Great Bear Lake and its Watershed, directed by the Great Bear Lake Working Group and facilitated and drafted by Tom Nesbitt

⁶⁵ ibid

mountains have little storage capacity. For this reason peak flows can take place over the summer or autumn months.

Directions of Water Flow

The Sahtu has four major directions of water flow: ⁶⁶

- 1) West Mackenzie Region – water flows eastward from the Mackenzie Mountains and the watersheds drain into the Mackenzie River from the west side;
- 2) East Mackenzie Region – water flows westward into the Mackenzie River from the east side;
- 3) Arctic Region – water flows northward into the Arctic ocean;
- 4) Great Bear Region – water flows into the Great Bear Lake, which then flows into the Mackenzie River via Great Bear River.

2.3.3 Community Source Drinking Watersheds

“As part of ENR’s actions towards Keeping NWT Water Clean within the “Managing Drinking Water in the NWT: A Preventative Framework and Strategy”, each community’s drinking water catchment area was mapped at a scale of 1:250,000.”⁶⁷ “Each community’s public water source intake was located using Municipal and Community Affairs (MACA) community infrastructure records. For purposes of water management initiatives, municipal wastewater outflow locations have also been identified from MACA community infrastructure records.”⁶⁸

The mapping can be used by communities to identify the catchment area for their drinking water. The maps produced for the Community Public Water Supply Catchment Area from the GNWT’s Spatial Data Warehouse are included below.

See Map 13. Community Drinking Water Source Catchments and Upstream Catchments

⁶⁶ Excerpted from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada’s Northwest Territories, 2005, Sahtu GIS Project, P.36

⁶⁷ GNWT Spatial Data Warehouse, Community Public Water Supply Catchment Area Maps: <http://maps.gnwtgeomatics.nt.ca/portal/watershedmaps.jsp>

⁶⁸ *ibid*

Map 13. Community Drinking Water Source Catchments and Upstream Catchments

2.4 LANDCOVER AND ECOREGIONS

2.4.1 Boreal Biome⁶⁹

Much of the Sahtu is located in the boreal or “northern” forest – Canada’s largest biome. The boreal biome stretches between northern tundra and southern grassland and mixed hardwood trees.

The boreal biome in Canada starts in the Yukon Territory, forming a band almost 1000 km wide and sweeps southeast towards Newfoundland. To its north is the treeline and beyond that the tundra of the Arctic.

The NWT treeline (shown on Map 10. Permafrost and Treeline) runs diagonally south-eastward, just north of Inuvik to the southeast corner of the Sahtu.⁷⁰ Permafrost in the majority of the Sahtu is extensive discontinuous (50-90%) and in the northern areas it is continuous (90-100%). Where permafrost is close to the surface, the active or seasonally thawed soils are too thin to accommodate roots.

Treeline is variably defined, but it is generally where trees are less than a couple of meters tall and their growth is limited by a combination of cold soils that are frozen for most of the year, short growing seasons that do not allow cones and needles to mature, and nutrient poor conditions.⁷¹

In the region a variety of soils occur, from permanently frozen organic soils to deep, fine textured calcareous soils in some places. Thin soils are more likely in the mountains or on the shield to the east.⁷² Coniferous trees are the dominant tree type in the region as they are well-adapted to the harsh climate and thin acidic soils.

2.4.2 Forest Fires⁷³

The boreal forest of the Sahtu has been shaped by fire for thousands of years. All life in these forests has in some way adapted to or in many cases, come to rely on the presence of natural wildfire. In the heart of the boreal forest, natural fire frequency ranges from 50-200 years.

It is now widely acknowledged that our efforts to suppress wild fires may in fact be skewing the pattern of wildfires toward less frequent but larger and hotter fires. By allowing dead wood and

⁶⁹ Excerpted from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada’s Northwest Territories, 2005, Sahtu GIS Project, P.43

Verified through Personal Communication, Bob Decker, Wildlife Biologist – Habitat Conservation, ENR, GNWT & Dave Downing, Ecologist, Timberline Natural Resource Group, February 17, 2010

⁷⁰ Dave Downing, Timberline Natural Resources Group, personal communication

⁷¹ Bob Decker, Forest Ecologist, Forest Management, GNWT, personal communication

⁷² Dave Downing, Timberline Natural Resources Group, personal communication

⁷³ Excerpted from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada’s Northwest Territories, 2005, Sahtu GIS Project, P.44

Personal communication: Tom Lakusta, Forest Resources Manager, ENR, GNWT February 15, 2010

Frank Lepine, Fire Operations Manager, ENR, GNWT, February 24, 2010,

Kris Johnson, Fire Science Manager, ENR, GNWT, February 26, 2010

other fuel sources to build up in the forest, we are setting the stage for more destructive fires.

Fire has the following effects on forests:

- breaks rocks and builds soil;
- kills pathogens and bacteria;
- clears accumulated leaf and needle litter exposing good mineral-soil seed bed;
- fire blackened soil absorbs light, creating a greenhouse effect for seeds and seedlings;
- knocks back fire-sensitive/shade-tolerant trees;
- helps re-establishment of conifer forest; and
- recycles nutrients that are locked up in leaf litter and woody debris.

Fires can have both positive and negative effects on forest productivity. Ash from fires is rich in nutrients and can result in a flush of new growth in the years following a wildfire. There are areas where wildfires seem to have the effect of sterilizing the soils and causing a decrease in forest productivity.⁷⁴ Slow regeneration following fires may contribute to the long-term treeless status of burned areas in the most northerly areas.⁷⁵

See Map 15. Fire History in the SSA (1960-2005)

2.4.3 Ecological Classification⁷⁶

Ecological classification is a systematic way of describing and assessing ecological diversity, which has broad application for a number of areas such as: environmental assessment, cumulative effects management, biodiversity monitoring and reporting, forest resource analysis and planning, wildlife habitat evaluation and conservation, and protected area identification.

Ecological classification systems exist at global, national, regional and smaller scales. Similar to watersheds, the smaller scale classifications fall within the larger scales in a nested hierarchy.

The Government of the Northwest Territories has been using the national ecosystem classification framework since 1996 as the basis for identifying candidate protected areas, forest

⁷⁴ Tom Lakusta, Manager, Forest Resources, Forest Management Division, GNWT, ENR, personal communication

⁷⁵ Ecological Regions of the Northwest Territories Taiga Plains, Ecosystem Classification Group 2007, Revised 2009, P. 19, GNWT, ENR

⁷⁶ Section based primarily on:

Ecosystem Classification Group. 2007 (rev 2009). Ecological Regions of the Northwest Territories - Taiga Plains. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. viii + 173 pp. + folded insert map

Ecosystem Classification Group. 2010. DRAFT Ecological Regions of the Northwest Territories - Cordillera. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. viii + 245 + x pp. + insert map

Ecosystem Classification Group. 2008. Ecological Regions of the Northwest Territories - Taiga Shield. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. viii + 146 pp. + insert map

Map 14. Fire History in the SSA (1960-2005)

management planning, wildlife habitat management and environmental impact assessment and mitigation.

Recently, the Government of the Northwest Territories has modified the Canadian national classification framework to produce a more definitive regional ecosystem classification system of its own. It uses 4 levels of classification. The levels of classification that exist in the Sahtu Settlement Area (SSA) are shown in Table 9. Ecoregions in the Sahtu Settlement Area.

Level I Taiga and Boreal Ecoregions

The Sahtu region lies mostly within the Level I Taiga Ecoregion. Some small south-western parts of the SSA lie within the Level I Boreal Ecoregion.

Level II Ecoregions

[Level II Taiga Plains Ecoregion](#)⁷⁷

Much of the Taiga Plains drains into the Arctic Ocean via Canada's largest river, the Mackenzie and its main tributaries. The tributaries occurring in the Sahtu are: Keele, Carcajou, Mountain, Great Bear and Arctic Red Rivers. Tens of thousands of smaller lakes and ponds also occur.

The Mackenzie Valley is one of the major peatland areas in Canada. Peatlands occur over almost half of the total Taiga Plains area. The Taiga Plains and the Taiga Shield are sometimes called "the land of little sticks." Long cold winters and short cool summers limit tree and other plant growth and contribute to large areas of permanently frozen soil.

[Level II Taiga Shield Ecoregion](#)⁷⁸

Very little of the Sahtu is found within the Level II Taiga Shield Ecoregion which extends across Canada from Labrador west to the Northwest Territories. Glaciers covered most of the Taiga Shield, leaving behind glacial till deposits. Eskers (raised beds of gravel and sand – kind of like a raised railroad embankment) are common especially in the eastern half of the NWT. Eskers were formed when rivers transporting sand and gravel left them in ridges tens of metres high and tens of kilometres long.

Nearly 200,000 lakes ranging in size from the Great Slave Lake to ponds less than 100 ha are found in the Taiga Shield. The Taiga Shield drains to the Arctic Ocean via Great Slave, Great Bear Lake and the Mackenzie. The Taiga Shield also drains to the Hudson Bay via the Thelon and Dubawnt River systems.

Also known as the "land of little sticks," it has tree species that are adapted to a fire environment.

⁷⁷ Ecosystem Classification Group. 2007 (rev 2009). Ecological Regions of the Northwest Territories - Taiga Plains. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. viii + 173 pp. + folded insert map

⁷⁸ Ecosystem Classification Group. 2008. Ecological Regions of the Northwest Territories - Taiga Shield. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. viii + 146 pp. + insert map

Table 9. Ecoregions in the Sahtu Settlement Area

Level I Ecoregion	Level II Ecoregion	Level III Ecoregion	Level IV Ecoregion	
Taiga	Taiga Plains	Taiga Plains High Subarctic (HS)	Arctic Red Plain High Subarctic (HS)	
			Travaillant Upland HS	
			Anderson Plain HS	
			Colville Upland HS	
			Colville Plains HS	
			Colville Hills HS	
			Great Bear Upland HS	
			Great Bear Plain HS	
			Grandin Plain HS	
			Grandin Upland HS	
			Lac Grandin Upland HS	
			Taiga Plains Low Subarctic (LS)	Arctic Red Plain Low Subarctic (LS)
				North Mackenzie Plain LS
				Norman Range LS
	Great Bear Upland LS			
	Great Bear Plain LS			
	Taiga Shield	Taiga Shield High Subarctic (HS)	Blackwater Upland LS	
			Keller Plain LS	
		Taiga Shield Low Subarctic (LS)	Lac Grandin Plain LS	
Lac Grandin Upland LS				
Radium Hills High Subarctic (HS)				
Cordillera	Taiga Cordillera	Taiga Cordillera High Subarctic (HS)	Radium Hills High Subarctic (HS)	
			Coppermine Upland HS	
		Taiga Cordillera Low Subarctic (LS)	Radium Hills Low Subarctic (LS)	
			Calder Upland LS	
			Camsell Plain LS	
			Canyon Ranges High Subarctic (HS _{as})	
			Shattered Range HS _{as}	
			Arctic Red Upland Low Subarctic (LS _b)	
			Carcajou Plain LS _b	
			Canyon Ranges LS _{sa}	
	Tigonankweine Range LS _{as}			
	Boreal Cordillera	Boreal Cordillera High Boreal (HB)	Sayunei-Sekwi Ranges LS _{as}	
			Southern Backbone Ranges LS _{as}	
			Thundercloud Range LS _{as}	
		Boreal Cordillera Mid-Boreal (MB)	Painted Mountains LS _{sa}	
			Raven-Redstone Valley LS _{sb}	
			Mackenzie Foothills LS _{bs}	
			Central Mackenzie Plain LS _b	
			Franklin Mountains LS _{sa}	
Central Mackenzie Valley High Boreal (HB _b)				
Natla Plateau Mid-Boreal (MB _{as})				
Sapper Ranges MB _{as}				
Itsi Mountains MB _{as}				
Mount Pike MB _{as}				
Ragged Range MB _{as}				
Ragged Range Valley MB _{bs}				

Source: reproduced in part from Ecological Regions of the Northwest Territories – Taiga, Shield & DRAFT Cordillera report

[Level II Taiga Cordillera Ecoregion & Level III Boreal Cordillera Ecoregion](#)⁷⁹

As a whole, the Cordillera is a complex landscape of rugged peaks and ridges, rolling hills, eroded plateaus, deep V- and U-shaped valleys, fast-flowing braided rivers and streams and slow-flowing meandering rivers. In the south and east there are glaciers and icefields.

Glacial deposits are broadly distributed and mostly found on the floors and lower slopes of valleys. Lakes and ponds are small and thinly distributed. Wetlands are locally common only on the floodplains and lower slopes of large rivers and on a few broad plateaus. This is in contrast to the Taiga Plains that mostly has a low-relief with slow-flowing meandering rivers, thousands of lakes and ponds.

See Map 15. Level I and II Ecoregions.

Level III and IV Ecoregions

The Level II Ecoregions are further divided into Level III Ecoregions which are subsequently divided into Level IV Ecoregions.

General descriptions of the Level III Ecoregions can be found in the Appendices. Readers are referred to the respective reports for descriptions of the Level IV Ecoregions. Level IV Ecoregions were used extensively in defining land use zones.

See Map 16. Level III and IV Ecoregions.

Planning Across Ecoregions

The Sahtu has a number of Level IV Ecoregions that cross into adjacent jurisdictions (Yukon, Nunavut, Dehcho, Tlicho, or other Settlement Regions). The Sahtu Land Use Plan (SLUP) has taken these transboundary issues into account during zone designation to ensure that enough protection is offered to sensitive areas, features or species.

As people travel across the landscape, so do wildlife and to a lesser degree, vegetation. Transboundary planning allows for protection across borders and creates transportation corridors. Planning across boundaries ensures that species, landforms and ecologically sensitive areas do not become isolated pockets of protection surrounded by land for development.

Some Level IV Ecoregions are found only in the SSA and nowhere else in Canada. The Colville Hills HS, Colville Plains HS and Grandin Plains HS (Caribou Point or Edailla) have unique combinations of climate, vegetation, geology and other natural features that are unique to the Sahtu. Planning for these two ecoregions requires special attention and consideration.

⁷⁹ Ecosystem Classification Group. 2010. DRAFT Ecological Regions of the Northwest Territories - Cordillera. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. viii + 245 + x pp. + insert map

Map 15. Level I and II Ecoregions

Map 16. Level III and IV Ecoregions

2.5 ECOLOGICALLY SIGNIFICANT AREAS

2.5.1 Representation Analysis

The NWT Protected Areas Strategy (PAS) uses a “community-based process to establish a network of protected areas across the NWT”.⁸⁰

The PAS’ goals are to identify and protect:

- special natural and cultural areas in the NWT;
- core representative areas within each of the 42 ecoregions of the NWT.⁸¹

The PAS tries to achieve ecological representation in its protected areas and within the NWT’s regional plans. Ecological representation means “protecting samples of broad landscape and habitat variations in each ecoregion of the NWT” in order to “help protect the majority of species” that occur in the NWT.⁸² Protecting portions of each ecoregion will in theory, help conserve the different life forms that are found in the NWT and their habitats.

Ecological representation cannot be met through protected areas alone. It is just one way to offer some protection for the territory’s species.

As discussed in the Plan, Conservation Zones and Special Management Zones play particularly important roles in conserving biodiversity. They provide connectivity and travel corridors between landscapes which are required for species that move over large landscapes.

The PAS Science Team provided the SLUPB with an ecological representation analyses⁸³ report to help the Board represent as fully as possible the diverse features and species of the Sahtu.

The report included:

- areas identified as important for ecological representation by the Marxan computer model when run 100 times;
 - areas that appeared 90-100% of the time
 - areas that appeared 61-89% of the time
 - areas that appeared 30-60% of the timeSee Map 17. Marxan Ecological Representation Analysis
- special features which include:
 - rare and may-be at risk plants;
 - hot and warm springs;
 - mineral licks;
 - karst (when water dissolves bedrock creating “holey rocks” like caves, sinkholes, springs, disappearing streams, etc.);

⁸⁰ NWT Protected Areas Strategy website: <http://www.nwtpas.ca>

⁸¹ *ibid*

⁸² Northwest Territories Protected Areas Strategy Science Team. (August 6, 2009). Ecological Representation Analysis of Conservation Zones/Protected Areas Initiatives in the April 30, 2009 Draft Sahtu Land Use Plan, P. 4-5

⁸³ *ibid*

- glacial refugia (areas that were never covered in ice during the last ice age – plants and animals took shelter in these areas and today a high diversity of species and rare and/or unique species can still be found); and
- amphibians.

See Map 18. Ecologically Significant Areas

The Board considered the results of the PAS analysis in its decision-making process. An Ecologically Representative Areas map was created to identify the areas identified for protection by the Marxan model. A second map of Ecologically Significant Areas was produced to include the special features as well as karst features identified through Dr. Derek Ford's report⁸⁴ and the International Biological Program (IBP). Both maps were used by the Board during decision making as the zones were being created and revised.

2.5.2 Karst Landforms

Karst landscapes form where rock dissolves in water (e.g., limestone), creating features like sinkholes, caves, dry valleys and gorges, turloughs and poljes (large depressions drained underground by sinkholes within them, which are periodically flooded when the underlying caves become swamped with water). Karst landscapes sometimes contain 'disappearing' streams or underground rivers. Karst landscapes often have spectacular scenery and unique communities of plants and animals.⁸⁵ The Sahtu Settlement Area contains world class examples of karst that should be protected.

In 2007 Dr. Derek Ford, Professor Emeritus in the Department of Geography and Earth Sciences at McMaster University and one of the world's leading karst experts visited the Sahtu. He located, photographed and described some of the karst sites in the Sahtu Settlement Area and released "Report upon a Survey of Karst Landforms around Norman Wells, Northwest Territories" in March 2008.⁸⁶ The report was produced for the NWT Protected Areas Strategy (PAS) and served to identify and locate special karst features in the Sahtu that should be protected.

Dr. Ford's recommended sites were considered by the SLUPB and are represented in Map 18. Ecologically Significant Areas.

⁸⁴ Report upon a Survey of Karst Landforms around Norman Well, Northwest Territories. March 2008. Written and prepared by Derek Ford (Professor Emeritus, Georgraphy and Earth Sciences, McMaster University) for the NWT Protected Areas Strategy, ENR, GNWT.

⁸⁵ ibid

⁸⁶ ibid

Map 17. Marxan Ecological Representation Analysis

Map 18. Ecologically Significant Areas

2.5.3 International Biological Program (IBP) Sites⁸⁷

The International Biological Programme (IBP) was a cooperative study of the land conducted from 1969 to 1974. It involved the International Council of Scientific Unions and 58 participating nations around the world.

The goals for the north were to:

- 1) locate and describe representative examples of natural arctic and subarctic ecosystems in cooperation with locals and others;
- 2) demonstrate how the biological value of the sites may equal or outweigh all other values of that site;
- 3) help the Territorial and Federal Governments develop guidelines to manage and recognize these areas as Ecological Sites.

The IBP Ecological sites are special areas that represent a variety of plant and animal communities. The vegetation, animals, soils and other physical characteristics form balanced ecosystems. Many of the sites have special features such as endangered or relict (very old) populations, unique plants, breeding areas and critical range for animals, pristine lakes, mineral springs or other naturally unique features.

The IBP Sites have been used in the Zone Descriptions in Chapter 5 of the Plan. IBP Sites can be found in Map 18. Ecologically Significant Areas.

2.6 WILDLIFE

The land is very important to us. Not only do we live on it but also the wildlife survives on it. As humans, we survive by eating the wildlife. That also is a way of life.

Water, wildlife, caribou, moose, beaver, muskrat, and fish. These are all life sustaining for us. We can't allow these resources to be mismanaged. We have to be constantly aware of our responsibility for proper land management... We can't break our connection to nature.⁸⁸

K'eyeneyo means "place where sheep are chased down." It is an isolated mountain, south of the Gravel River, at the headwaters of the Moose Horn River. It is a good place to find ewes and lambs at this time of year. In the old days, sheep were chased down from the tundra plateau into snares of babiche.

⁸⁷ International Biological Program (IBP) Ecological Sites in Subarctic Canada, Areas recommended as Ecological Sites In Region 10, Yukon and Northwest Territories Boreal Forest to the Treeline, 1975, Edited by Dorothy K.B. Beckel, Coordinator Region 10 (Subarctic) Panel, Lethbridge, Alberta, The University of Lethbridge Production Services, CCIBP/CT

⁸⁸ From Sahtu Land Use Planning Board – Building a Vision for the Land, 1999

Sheep are famous for their climbing skill... But there is one cliff they cannot climb, north northwest of K'eyeneyo. It is called Petl'aenejo, or "mountain where sheep are run against a cliff." There they could be killed by hunters.⁸⁹

2.6.1 Species of Importance in the Sahtu Settlement Area (SSA)

A variety of wildlife species exist in the Sahtu Settlement Area (SSA). Some species are of traditional significance as they have been and continue to be used by people for subsistence and/or cultural reasons. Other species are rare, endangered, or sensitive to human influences and require special attention. Certain species are of ecological significance because they tell us about the relative health of an ecosystem. We call these indicator species. Still others play a part in the region's economy for the local people and through tourism and outfitting activities. The Plan has concentrated on key species of interest that represent the values or uses just identified.

Mammals include some of the species that are, and have for thousands of years been most important to people in the North for food, clothing, tents, boats, tools, and as a source of income through the sale of furs, hides, crafts, and meat.⁹⁰ In addition to humans, there are 65 species of terrestrial mammals in the NWT, from tiny shrews, voles and lemmings to caribou, moose, bear, and Dall's sheep.

Caribou

Caribou are one of the most important species to people in the Sahtu. They are a staple of Dene and Métis subsistence harvests and their seasonal migrations have historically determined people's movements on the land.

Two subspecies of caribou exist in the Sahtu:

- 1) barrenground caribou
 - mostly found in the arctic and high arctic
 - migrate over large areas of land and travel in herds
 - associated with widely publicized population declines in the last few decades
- 2) woodland caribou
 - boreal caribou - non-migratory, live year-round in forested regions of the Mackenzie Valley
 - mountain caribou – migratory, live between the forested and alpine habitats of the Mackenzie Valley

Boreal caribou are sensitive to activities associated with oil and gas exploration and extraction, particularly the cutting of seismic lines through the forests in which the caribou live. Research

⁸⁹ From Snowshoes and Ptarmigan Feathers by Norman Simmons with Maurice Mendo, Originally published in the Mackenzie Valley Viewer, October 2002, taken from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada's Northwest Territories, 2005, Sahtu GIS Project, P.50

⁹⁰ NWT Species 2006-2010, General Status Ranks of Wild Species in the Northwest Territories, P. 16, 2006, GNWT, ENR

by Alberta's Boreal Caribou Research Program⁹¹ in the northeast of the province has found that wolves can travel faster along seismic lines than through the forest, especially during the summer. This increases predation on caribou.

Caribou are more likely to be found at minimum 250 m from seismic lines suggesting that habitat within 250 m from seismic lines to be to a certain extent degraded.⁹² Biologists are examining the density of seismic lines across the Sahtu to determine the current oil and gas "footprint" in the region. The GNWT in cooperation with other stakeholders has been developing draft guidelines for seismic lines in the NWT.⁹³

Moose

The Dene and Métis historically and continue to rely heavily on moose for survival. The hides were painstakingly prepared and sewn together to use as tents and to cover large spruce frame boats. Moosehide leggings, coats, hats and footwear were used to keep warm. Moose meat was essential to subsistence. A successful hunt was occasion for a feast. Elders would be honoured with the head of the moose, a delicacy still enjoyed today.⁹⁴

Today moose is still an important resource in many Sahtu communities. It continues to be a staple food as one animal can yield as much as 300 kg of meat. The hides are usually home-tanned and used for making slippers, mukluks, traditional dress, heavy winter mitts and handicrafts. Some elders continue to use sinew to make thread for sewing as it is extra sturdy for items like footwear. Elders generally prefer moosehide slippers to shoes for both outdoor and indoor footwear.⁹⁵ Most hunters and trappers below the treeline still prefer handmade moccasins to manufactured winter footwear.

Caribou (barrenground and woodland) and moose continue to make up a significant portion of the year-round Dene and Métis diet. The meat used to be smoked and dried, making it less bulky, significantly lighter, and ready to eat at any time. Dry meat is still made today and is a widely appreciated delicacy.

Both woodland and barrenground caribou are sensitive to development. In the recent past some herds have faced rapid population declines making them an important species to consider in planning. Similarly, moose are considered due to their importance for subsistence and cultural reasons.

⁹¹ Boreal Caribou Research Program, Department of Renewable Resources, University of Alberta: <http://www.deer.rr.ualberta.ca/caribou/BCRP.htm>

⁹² The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada's Northwest Territories, 2005, Sahtu GIS Project

⁹³ "NWT Guidance for the Protection of Land, Forest, and Wildlife, Oil and Gas Seismic Exploration", Department of Environment and Natural Resources, Environment Canada, Indian and Northern Affairs Canada, Draft June 13, 2008

⁹⁴ Excerpted from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada's Northwest Territories, 2005, Sahtu GIS Project, P.49

⁹⁵ Excerpted from The Sahtu Atlas, Maps and Stories from the Sahtu Settlement Area in Canada's Northwest Territories, 2005, Sahtu GIS Project, P.49

Waterfowl and Fish

In the spring time waterfowl such as ducks and geese are harvested. Dry geese continues to be a largely sought after seasonal product. Migratory birds are also species of interest because of the Migratory Bird Convention Act, an international agreement to which Canada is a signatory. The Mackenzie River islands and valley are important stopping grounds along the migratory routes of many species and allow them successfully complete their migration every year.

In the summer families use their fish camps to produce large amounts of dry fish. In the winter people continue to set nets or lines under the ice. Fish lakes, the Mackenzie River and its tributaries continue to be used for subsistence fishing of lake trout, pike, lake whitefish, walleye, inconnu and others. The nutritional and subsistence value of the mammals, waterfowl and fish species listed above is significant.

Big Game and Furbearers

Economically speaking, big game outfitters are a significant part of the tourism industry in the SSA. Non-resident hunters are primarily interested in Dall's sheep and mountain caribou. Non-resident hunters will also hunt moose and mountain goats. Wolves, wolverines and black bears are also open for harvest and are occasionally taken.

Furbearers such as marten, beaver, fox, muskrat, mink and wolverine are a source of revenue for people of the Sahtu. Despite the fluctuations in fur prices the winter trapping season can be a reliable source of income year after year.

Wildlife species serve a number of purposes. This chapter will focus on the species that are of special importance to the SSA whether it be for socio-cultural, economic, or ecological reasons. Some species are of importance in the Sahtu because they are sensitive to disturbance, threatened or at risk. They are discussed below.

2.6.2 Species at Risk and COSEWIC

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is a national committee of experts that assesses the health of species in the country (see Table 9 – these same categories are used in the NWT Territorial listings). COSEWIC recommends to the federal government a list of species that it feels need special attention. The federal Minister considers COSEWIC's assessment and decides whether or not to adopt it under the federal *Species at Risk Act*.

COSEWIC recommendation includes mammals, birds, reptiles, amphibians, fish, arthropods, molluscs, plants, butterflies, moths, lichens, and mosses.

In 2009, COSEWIC identified a number of species in the Sahtu Settlement Area (SSA) that need extra consideration and protection. They are listed in Table 9. At the most recent verification, in June 2010, no mammals were considered endangered in the NWT however the Eskimo curlew, (a bird) was assessed as endangered and some mammals and birds were assessed as threatened or of special concern.

Table 10. COSEWIC Assessment

COSEWIC Ranking	Status
Extinct	A wildlife species that no longer exists anywhere in the world
Extirpated	A wildlife species that no longer exists in the wild in Canada, but exists elsewhere
Endangered	A wildlife species facing imminent extirpation or extinction
Threatened	A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
Special Concern	A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats

Some mammal species receive particular attention, either because of their importance to people in the traditional economy, as a result of their population status, or both.⁹⁶ Caribou is one such species because people in the north rely so heavily on caribou for meat and traditional uses.

Caribou as a species is considered “secure” within the NWT but Peary caribou are ranked as “at risk”. Over the past 5-10 years all barren-ground caribou herds in the NWT have declined significantly. As a result, barren-ground caribou (except Dolphin-Union herd) were ranked as “sensitive” in the NWT Species 2006-2010 General Status Ranks report.

Boreal woodland caribou was assessed as “threatened” in Canada by COSEWIC but they are not at risk in the Sahtu or in the NWT. The territory has ranked them as “sensitive”.⁹⁷

Table 11. Sahtu Species on the COSEWIC List as of April 2009

COSEWIC assessment	Mammals	Birds
Endangered	None	Eskimo Curlew (<i>Numenius borealis</i>)
Threatened	Woodland Caribou (<i>Rangifer tarandus caribou</i>) Boreal populations	Common Nighthawk (<i>Chordeiles minor</i>) Olive-sided Flycatcher (<i>Contopus cooperi</i>)
	Polar Bear (<i>Ursus maritimus</i>)	Peregrine Falcon (<i>Falco peregrines</i>); anatum-tundrius complex
Special Concern	Grizzly Bear (<i>Ursus arctos</i>)	Rusty Blackbird (<i>Euphagus carolinus</i>)
	Wolverine (<i>Gulo gulo</i>) – Western population	Short-eared Owl (<i>Asio flammeus</i>)
	Woodland Caribou (<i>Rangifer tarandus caribou</i>) – Northern Mountain populations	Horned Grebe (<i>podiceps auritus</i>) – Western population

Source: Environment and Natural Resources, GNWT

⁹⁶ ibid

⁹⁷ Ibid

2.6.2 Canada's Species at Risk Act (SARA)

Canada's Species at Risk Act (SARA) is "a key federal government commitment to prevent wildlife species from becoming extinct and to secure the necessary actions for their recovery. It provides for the legal protection of wildlife species and the conservation of their biological diversity."⁹⁸

"The Act establishes Schedule 1 as the official list of wildlife species at risk. It classifies those species as extirpated, endangered, threatened, or of special concern. Once listed, the measures to protect and recover a listed wildlife species are implemented."⁹⁹ The Schedule 1 list is based on the recommendations of COSEWIC, as described above.

Territories and provinces develop their own Species at Risk Acts as well but they create them to conform to the Federal Species at Risk Act. In that way, territories, provinces and federal legislation work collaboratively to recover species that require special attention.

2.6.3 Northwest Territories (NWT) Species at Risk Act

The *Species at Risk (NWT) Act* came into force February 1st, 2010.

The *Species at Risk (NWT) Act* identifies, protects and recovers species at risk in the NWT. The Act applies to any wild animal, plant or other species managed by the Government of the Northwest Territories. It applies everywhere in the NWT, on both public and private lands, including private lands owned under a land claims agreement.

The *Species at Risk (NWT) Act* allows the NWT government to assess species status at the territorial level - which could differ from the national level. The legislation allows the territory to identify the threats facing the species in the NWT and identify what actions are necessary to protect, conserve and recover that species.

In the Sahtu Settlement Area (SSA) responsibility for the conservation and recovery of species at risk in the NWT is shared among:

- wildlife co-management boards established under land claim agreements,
- the Minister of Environment and Natural Resources (ENR), and
- the federal government.¹⁰⁰

The NWT Species at Risk listing for the Sahtu is slightly different from the COSEWIC assessment. Table 12 lists NWT's listing of species whose range occurs within or extends into the SSA.

⁹⁸ Government of Canada, Species at Risk Public Registry, Species at Risk Act: http://www.sararegistry.gc.ca/approach/act/default_e.cfm

⁹⁹ Government of Canada, Species at Risk Public Registry, Species at Risk Act: http://www.sararegistry.gc.ca/species/default_e.cfm

¹⁰⁰ ENR website, "Species at Risk in the NWT": http://www.enr.gov.nt.ca/live/pages/wpPages/Species_at_Risk.aspx

Table 12. NWT Species at Risk in the SSA

NWT Listing	Mammals	Birds	Amphibians	Fish
Endangered	---	Eskimo Curlew	---	---
Threatened	Boreal woodland caribou	Peregrine falcon (<i>anatum</i>) Olive-sided flycatcher Common nighthawk	---	Shortjaw cisco (potentially in Sahtu)
Special Concern	Woodland Caribou Northern Mountain Population	Rusty blackbird	Northern leopard frog	---

Source: NWT Species at Risk

2.6.4 Habitat Sites and Harvesting Sites

A number of wildlife reports and mapping projects were used by the Board to make zoning decisions. The mapping usually falls into one of two categories, habitat sites or harvest sites. Both habitat and harvest locations are important wildlife considerations and were used to identify significant areas for wildlife. For most species there is both habitat and harvesting information but in some cases only one or the other was available. The maps at the end of the chapter show the sources of information that the Board used in decision making.

Habitat Information

Habitat information often came from traditional knowledge (TK) and scientific mapping projects or reports identifying sensitive habitat areas such as the:

- Fort Good Hope Chevron TK project,
- Tulita TK project,
- INAC TK project,
- GNWT's Important Wildlife Areas (IWA) report,
- Ducks Unlimited Canada's (DUC) Duck Breeding Density Report,
- Canadian Wildlife Service's (CWS) Key Migratory Bird Terrestrial Habitat Sites in the NWT and Nunavut,
- ENR's Seasonal Ranges of the Cape Bathrust, Bluenose-West, and Bluenost-East Barren-ground Caribou Herds,
- Norm Simmons data on Dall's Sheep ranges in the Mackenzie Mountains,
- ENR wildlife species range mapping done in collaboration with the SLUPB.

Habitat data represent areas that are important or essential to the viability and health of the species or population. These can be calving/nesting grounds, migration paths, breeding sites/rutting grounds, areas where animals consistently gather in large numbers, seasonal ranges, or other areas that are valuable to wildlife. The consideration of these areas should decrease human impacts on wildlife and in some cases, offer wildlife species protection at times in their lifecycle when they are most vulnerable.

Harvest Information

Habitat sites differ from harvest sites. They reflect areas where people have successfully harvested wildlife as opposed to appropriate habitat. Harvest sites tend to be closer to the communities and are to an extent determined by ease of access. They may include traditional family gathering areas, cultural sites or areas close to access roads or shorelines. Although harvest sites do not specifically represent sensitive or important habitat areas they are a good surrogate for habitat because they tend to be where animals congregate or can be found on a regular basis.

Harvest data was collected from a number of TK projects and harvest reports such as:

- Fort Good Hope Chevron TK project,
- Tulita TK project,
- INAC TK project,
- ENR wildlife biologist mapping done in collaboration with the SLUPB,
- the Sahtu Renewable Resources Board (SRRB) Harvest Study, and
- the Special Harvesting Areas from the land claim.

2.6.5 Sources Used

Below is a brief description of the reports and mapping projects used to make wildlife-related decisions.

Special Harvesting Areas

S. 13.4.4 of the SDMCLCA establishes Special Harvesting Areas in which Participants can harvest fish, moose and migratory birds. Non-participants may not harvest wildlife in these areas if such harvesting is inconsistent with the special harvesting of Participants, except for a 90 day period in the fall when non-participants will be allowed to harvest moose.

Although Special Harvesting Areas are only open to participants they also identify areas that have year after year provided reliable and plentiful harvest. As such, they can also act as surrogates for areas that are important for wildlife such as areas where they tend to congregate.

The Special Harvesting Areas are shown in Map 20. Special Harvesting Areas & FGH/Colville Lake Group Trapping Area.

Fort Good Hope-Colville Lake Group Trapping Area

S. 19.9.4 (c) of the SDMLCA re-affirms the existence of the Fort Good Hope-Colville Lake Group Trapping Area. It further states that the area may not be reduced in size without the consent of the designated Sahtu organizations in Fort Good Hope and Colville Lake. The Group Trapping Area was established in previous negotiations with the Government of Canada. It was intended to protect local Dene and Métis trappers by ensuring that the resources that they relied on were not overharvested by non-participants. The Fort Good Hope-Colville Lake Group Trapping Area is included in the plan to affirm its continued existence. See Map 19. Special Harvesting Areas & FGH/Colville Lake Group Trapping Area.

Map 19. Special Harvesting Areas & FGH/Colville Lake Group Trapping Area

Sahtu Settlement Harvest Study

Under S.13.5.6 of the SDMCLCA, the Sahtu Settlement Harvest Study was identified as a necessary step in order for the Sahtu Renewable Resources Board (SRRB) to effectively manage wildlife. The SRRB was established as the main instrument of wildlife management in the Sahtu Settlement Area (SSA). The SRRB works to protect, conserve and manage all renewable resources within the SSA in a sustainable manner to meet or exceed the needs of the public today and in the future.

The study counts the number of animals, fish and birds harvested by Dene, Métis, and non-aboriginal hunters, trappers and fishers over a five-year period from 1998-2003. The names of harvesters and information collected are confidential.

The communities of Colville Lake, Fort Good Hope, Norman Wells, and Tulita participated in the study from 1998-2003. The community of Déline participated in the study from 1999-2004. In January 2004, the SRRB decided to continue the study for two more years in all communities.

The information that has been collected is used to ensure the proper management of fish and wildlife in the SSA, to determine basic needs level and to assess the potential impact of new or existing developments (eg. oil and gas, mining, tourism) on harvesting. The harvest study maps were used in the Plan's Chapter 5: Zone Descriptions to identify areas that are of value for harvesters.

The intention of the study was to interview every eligible harvester in the SSA but not all participated. Those who did participate sometimes had trouble recalling the specifics of their harvests. Harvesters are sometimes on the land for a few weeks or months making it difficult to collect accurate information when they finally return to town. The SRRB Harvest Study is a representative summary of harvest locations in the SSA but should not be interpreted as a complete record of harvesting areas.

See Map 20. SRRB Harvest Study by Density.

INAC Traditional Knowledge (TK) Project (1992-1993)

In 1992-1993 INAC recorded a significant amount of traditional knowledge in the SSA. The study included a wide variety of wildlife harvest and habitat information. Habitat and harvest sites help to identify areas that are important to wildlife and areas that are important to the people who rely on the wildlife for subsistence harvest. The INAC TK information is included in the species specific maps at the end of this chapter.

Barrenground Caribou Seasonal Ranges¹⁰¹

In 2005, Environment and Natural Resources (ENR) released "Seasonal Ranges of the Cape Bathurst, Bluenose-West, and Bluenose-East Barrenground Caribou Herds", a report with

¹⁰¹ Nagy, J.A, Wright, W.H, Slack, T.M, and Veitch, A.M. 2005. Seasonal Ranges of the Cape Bathurst, Bluenose-West and Bluenose East Barren-Ground Caribou Herds, Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories

extensive caribou range mapping. Both the Bluenose-West and Bluenose-East barrenground caribou herds are found within the Sahtu Settlement Area (SSA).

Satellite tracking data from March 1996-May 2004 was used to track the three herds. Seasonal and cumulative ranges for each herd were identified. The data was grouped into 8 seasons:

- 1) calving/post calving (1-25 June),
- 2) early summer (26 June-15 July),
- 3) mid-summer (16 July-7 August),
- 4) late summer (8 August-7 October),
- 5) fall/rut (8-31 October),
- 6) fall/post rut (1-30 November),
- 7) winter (1 December-31 March), and
- 8) spring, spring migration, and pre-calving (1 April-31 May).

The report included series of maps that showed the geographic range of the seasonal and cumulative ranges used by each herd. Depending on the time of year, barrenground caribou use different geographic areas to meet their needs. These are their "seasonal ranges".

This work is important given the potential for oil and gas and other development activities on the winter ranges of the three herds. Development activities combined with wild fires may have significant impacts on these ranges. Caribou populations are sensitive to human impacts and the recent barrenground caribou populations have declined. This report identifies some of the key habitat locations at particularly vulnerable times in their lifecycle such as the calving/post calving times, the rutting season and migration and pre-calving times.

The study suggested that more research could better represent the caribou herd ranges. Further data collection would provide a better understanding of the locations of barrenground caribou herds when calves and cows are most sensitive. The study has been used in the Zone Description Chapter 5 of the Plan.

See Map 21. Bluenose West Caribou Migration.

See Map 22. Bluenose East Caribou Migration.

Seasonal Ranges of Dall's Sheep in the Mackenzie Mountains

From 1968-1974, the Canadian Wildlife Service (CWS) conducted studies on Dall's Sheep in the Mackenzie Mountains. The studies were intended to provide baseline data for the GNWT to help in the management of sport hunting in the mountains.

Non-resident sport hunting had not been allowed in the Mackenzie Mountains since 1938 when the Mackenzie Mountains Game Preserve was set aside to protect hunting grounds for Aboriginal use. From 1946 to 1956 it was observed that Aboriginal hunting in the Mackenzie Mountains had decreased significantly. Eventually in 1965, the Mackenzie Mountains were opened to non-resident sport hunting.

Norm Simmons was a biologist with CWS. From 1967-1972 he was stationed in the Mackenzie Mountains to monitor the impacts of big game hunting on wildlife health and populations. He worked with the local Dene and recorded TK such as place names.

Map 20. SRRB Harvest Study by Density

Map 21. Bluenose West Caribou Migration

Map 22. Bluenose East Caribou Migration

Norm Simmons counted, monitored and documented the locations of sheep over the study period. His observations represented a host of values such as:

- location of observations,
- mineral licks,
- animal counts,
- important places, and
- observations on sheep and mountain woodland caribou.

The data was retrieved in the last 10 years by Alasdair Veitch, Supervisor Wildlife Management, Sahtu Region and was digitized. Map 23 illustrates Norm Simmons' observations and other sources of information relating to Dall's Sheep. Although it is not possible to record all sheep habitat, the point data gives a good indication of the occurrence of sheep habitat in the Mackenzie Mountains. This information has been used in the Plan's Zone Descriptions in Chapter 5 of the Plan. See Map 23. Dall's Sheep.

Duck Breeding Sites – Ducks as Indicator Species¹⁰²

On July 31, 2009, Ducks Unlimited Canada (DUC) submitted a report to the SLUPB regarding the use of duck-related information to guide sustainable land use. The report mapped duck breeding areas in the Sahtu Settlement Area (SSA) and promoted the use of ducks as an indicator species for local environmental quality.

In the north and in the SSA ducks represent a wide range of avian diversity. Ducks can be used as "indicators" of a healthy environment since they rely on wetlands to forage for food and uplands to have their young. Where wetland and upland habitats are healthy, ducks will have increased chances of successful reproduction, survival and healthy population numbers.

A number of development activities can affect duck habitat such as:

- a) dams or modifications of wetlands for roads and other infrastructure,
- b) sediments from roads and other infrastructure getting into wetland areas,
- c) changing water and nutrient yield from cutting up forests,
- d) upland and wetland basin thawing resulting from development and/or climate change.

Ducks Unlimited Canada (DUC) produced a map of predicted breeding duck densities in the Taiga and Boreal Plains ecozones. The analysis indicated that about 25% of the landscape supports approximately 60% of the breeding duck population. The rationale is that these areas also represent important habitat for other waterfowl and that they should be considered for protection.

Due to gaps in knowledge and an evolving understanding of locations of suitable habitat for waterfowl, DUC stressed the importance of an adaptive management framework that includes monitoring, the flexibility to make changes over time, and on-going research to gain new knowledge. The areas that were modelled to support 60% of the duck breeding areas were considered in the Zone Descriptions in Ch. 5 of the Plan. See Map 24. Important Breeding Duck Habitat.

¹⁰² Ducks Unlimited Canada. Comments on Draft 2 SLUP, July 31/09.
<http://www.sahtulanduseplan.org/website/web-content/index.html>

Map 23. Dall's Sheep

Map 24. Important Breeding Duck Habitat

Key Migratory Bird Terrestrial Habitat Sites¹⁰³

In March 2006 the Canadian Wildlife Service (CWS) released the third edition of the “Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut”, a report that identifies key sites for migratory birds in the north.

“The report describes key terrestrial habitat areas that are essential to the welfare of various migratory bird species in Canada.”¹⁰⁴ “The preservation of adequate habitat (both in quantity and in quality) is fundamental to the conservation of all wildlife species.”¹⁰⁵

The sites identified in the report support at least 1% of the Canadian population of at least one migratory bird species or subspecies. The sites include marine and freshwater habitats. Four of the sites identified in the report are found in the SSA. The research used to identify the sites was taken from published and unpublished reports and personal communications. The report is “offered as a guide to the conservation efforts of federal and territorial governments, wildlife co-management boards established pursuant to land claim final agreements, Aboriginal and non-governmental organizations, and industry.”¹⁰⁶

Although site specific protection allows for the protection of habitat sites like staging areas, moulting areas, nesting colonies and foraging areas, it cannot provide general protection to migratory species. Some populations disperse themselves throughout a variety of habitats and rare, threatened or endangered species that occupy restricted habitats would be vulnerable if their habitat is threatened or disturbed. Studies like this one are good for identifying especially valuable habitat sites but TK reports were also used to identify waterfowl habitat to provide a wider range of protection.

The Zone Descriptions in Chapter 5 of the Plan relied on this report for migratory bird habitat sites. Key terrestrial migratory bird habitat sites are included in the species specific maps at the end of the chapter.

Important Wildlife Areas¹⁰⁷

The Government of the Northwest Territories released a copy of the “DRAFT Important Wildlife Areas in the Western Northwest Territories” report to the SLUPB in February 2010. The report provides maps and descriptions of known Important Wildlife Areas (IWA) in the NWT. The report was conducted from 2006 to 2009, is based on previous research and on discussions with communities, co-management boards, departmental staff and others.

¹⁰³ Latour, P.B, Leger, J, Hines, J.E., Mallory, M.L., Mulders, D.L., Gilchrist, H.G., Smith, P.A., & Dickson, D.L., March 2006, Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut, 3rd Ed., Occasional Paper, Canadian Wildlife Service (CWS)

¹⁰⁴ Ibid, P. 3

¹⁰⁵ Ibid, P. 7

¹⁰⁶ Ibid, P. 7-8

¹⁰⁷ Haas, C.A., & Wilson, M.J., DRAFT Important Wildlife Areas in the Western Northwest Territories, February 2010, Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT

The report provides information on Important Wildlife Areas (IWA) in the NWT in order to guide management decisions. The final report was to be completed in the spring of 2010 and will undergo 10-year reviews.

Wildlife Species Considered in the IWA Report

The GNWT has considered wildlife species for which it has management responsibilities. This includes species that fall under the NWT Wildlife Act but does not include fish, marine mammals or migratory birds as they fall under federal jurisdiction under the Fisheries Act and the Migratory Bird Convention Act.

Species also had to meet at least one of the following conditions:

- of high socio-economic importance;
- identified by harvesters and biologists as a species to consider; or
- listed as a Species at Risk in 2006 by:
 - Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as nationally “endangered” or “threatened”; or
 - COSEWIC as “special concern” and listed as “sensitive” or higher in the NWT.

Important Wildlife Areas (IWA) were defined as key wildlife habitat areas and had to meet at least one of the following six criteria:

1. Areas that many animals use traditionally, around the same time each year;
2. Places where animals consistently aggregate in relatively large numbers;
3. Areas that animal repeatedly use under adverse conditions as refugia (to take shelter);
4. Areas with source populations (area that supports healthy populations for “immigration” into less populated areas);
5. If a species has very low numbers in the NWT or very limited suitable habitat, their year-round range may be important;
6. Unique areas used by different species (e.g. mineral licks, hot springs, wetlands).

The species examined in the IWA report represent a segment of the ecologically important wildlife species in the NWT. A number of IWAs were mapped but they should not be interpreted as the only important wildlife areas. Much habitat in the SSA has not been included due to the stringent selection criteria mentioned.¹⁰⁸ A significant majority of the IWAs mapped show where species tend to congregate or areas that specific populations will use at specific times of the year.

¹⁰⁸ Wilson, J.M., Important Wildlife Areas in the Northwest Territories, draft September 2008, ENR, GNWT

Table 13. Species Considered in IWA Report that Occur in the Sahtu Settlement Area

	High Socio-Economic Importance	Endangered or Threatened (COSEWIC)	Special Concern (COSEWIC) and NWT status rank of Sensitive or higher
Barren-ground caribou	X		
Boreal Woodland caribou*	X	X	
Mountain Woodland caribou	X		
Dall's sheep	X		
Moose	X		
Mountain goat	X		
Muskox	X		
Grizzly bear			X
Beaver	X		
Lynx	X		
Marten	X		
Muskrat**	X		
Wolverine			X
Peregrine falcon***		X	
Rusty blackbird*			X
Short-eared owl*			X

* Boreal woodland caribou, wolverine, rusty blackbird and short-eared owl were considered but no IWAs could be mapped.

** Muskrat deemed to be of high socio-economic importance in areas outside of the Sahtu.

*** Due to the sensitivity of the IWAs for Peregrine falcons, they are only available upon request.

In addition to the Important Wildlife Areas for the above species, a number of unique areas (hot and warm springs, mineral licks, may-be at risk plants) were also mapped in the report.

The Important Wildlife Areas report was used in Zone Descriptions in Chapter 5 of the Plan.

Map 25. Important Wildlife Areas

2.6.6 Species Specific Wildlife Maps

A number of species specific maps have been created by the SLUPB. The sources of data reflect a compilation of data from the sources listed earlier in the chapter. The maps are intended to show readers a combination of wildlife habitat areas and harvest sites.

The maps vary as the data that the SLUPB was able to obtain for different species was not consistent. The maps represent the best data the SLUPB could find on important wildlife species and reflect a combination of scientific and traditional knowledge data.

See Maps 26-35 for species specific maps.

Table 14. Important Wildlife Areas located in the Sahtu Settlement Area

Wildlife Species	IWA Report Number	Important Wildlife Area (IWA) in the Sahtu
Barren-ground caribou	1	Core Calving and Post-calving Areas (1996-2006)
	3	Horton Lake
	4	Edajjla (Caribou Point)
Boreal woodland caribou	5	Headwaters of Arctic Red River and Ramparts Rivers
	6	South Nahanni Summer and Rut Range
	10	Drum Lake (Wrigley Lake)
	11	Redstone Calving and Early-midsummer Range
Dall's sheep	17	Northern Mackenzie Mountains
	18	Palmer Lake
	19	Dehcho Sheep Concentration Areas
	23	Between Carcajou Falls and Pyramid Mountain
Moose	29	Sahtu Rivers
	30	Ramparts River Wetlands
	31	Lac a Jacques Wetlands
	32	Florence Lake
	33	Three Day Lake
	34	Mirror Lake
	35	Wetlands southwest of Lac Ste Therese
	36	O'Grady Lake
	37	Dehcho Winter Use Areas
	42	Norman Wells to Fort Good Hope Winter Road
Muskox	50	Sahtu Muskox Areas
	51	Hare Indian River
Grizzly Bear	58	Mackenzie Mountains Barrens
	59	Grizzly Bear Area West of Wrigley
	60	Greater Nahanni Grizzly Bear Areas
Beaver	67	Gwich'in Beaver Concentration Areas
	68	Ramparts River Wetlands
	69	Loon Lake Wetlands
	70	Lac a Jacques Wetlands
	71	Willow Lake Wetlands
	72	Johnny Hoe River and Lac Ste Therese
	73	Dehcho Beaver Concentration Areas
Lynx	77	Dehcho Lynx Concentration Areas
Marten	81	Northern Sahtu Marten Area
	82	Caribou Point Marten Area
	83	Whitefish River Marten Area
	84	Wetlands Southwest of Lac Ste Therese
Unique Areas	91	Density of Known Mineral Licks
	102	Ramparts River Wetlands
	103	Plains of Abraham
	104	Willow Lake Wetlands
	105	Edajjla (Caribou Point)
	106	Moose Ponds
	110	Tui Ta Tui Lake
111	Johnny Hoe River	

Map 25. Important Wildlife Areas

Map 26. Bears

Map 27. Barren-Ground Caribou

Map 28. Boreal and Mountain Woodland Caribou

Map 29. Mountain Woodland Caribou Range

Map 30. Fish

Map 31. Furbearers

Map 32. Mountain Goat

Map 33. Moose

Map 34. Muskox

Map 35. Waterfowl and Birds

CHAPTER 3: ECONOMIC DEVELOPMENT & NATURAL RESOURCES

Since 1999 the NWT has experienced an increase in investment and mineral production. The Territory is now one of the world's largest exporters of diamonds and major new territorial investments are planned for the next few years.¹⁰⁹ Mining has helped the NWT achieve the highest average incomes in Canada and the highest GDP per business in the country.¹¹⁰ Record levels of economic growth were set in 2008 but the economic downturn has impacted the demand for diamonds, the NWT's primary export.¹¹¹ Oil prices have recovered but natural gas prices remain low.

The Sahtu Settlement Area (SSA) sees its greatest investments from the industrial sectors of oil and gas and mining. Although there are no current mines in the Sahtu the potential for future economic development can be significant given what has been found in similar geological areas. With respect to hydrocarbon potential, the Norman Wells oil fields are still in production although they have been in decline over the last few years. Tourism and outfitting services also contribute to the economic system in the SSA.

Future investments face challenges such as remoteness from markets, land access, a complex regulatory environment, lack of infrastructure, business services and human resources.¹¹² This section will consider some of the main drivers of economic development in the SSA. It will also explore some of the limitations to economic development.

3.1 INDUSTRY

3.1.1 Oil and Gas

Since the 1960s there have been significant expenditures on oil and gas exploration and development throughout the Sahtu. Although it depends on market variability, the Sahtu can ship over \$500 million in oil a year through the Zama Lake pipeline in Norman Wells – one of the largest oil fields in Canada.¹¹³

The economic benefits of hydrocarbon development in the north can be significant and include direct employment, local contracts, local hiring, spin-off employment and other benefits. Oil and gas investment can be a significant form of economic development for Sahtu communities.

¹⁰⁹ Economic Review Northwest Territories, 2009, GNWT, ITI.

¹¹⁰ *ibid*

¹¹¹ *ibid*

¹¹² *ibid*

¹¹³ Economic Review Northwest Territories, 2009. (September 2009) GNWT, Industry Tourism and Investment (ITI), P. 16

In 2008 crude petroleum production in the NWT was worth \$639,124,000 and natural gas production was \$43,856,000.¹¹⁴ The production of oil benefited from significant price gains. The low sales of natural gas reflect a lack of new investment in exploration and field development, especially in the southern NWT.¹¹⁵ In 2001 natural gas sales peaked at over just \$200 million.¹¹⁶

To summarize 2008 activities, INAC's Northern Oil and Gas Annual Report listed the following figures for the Sahtu:

- One new Exploration Licence was issued outside of Tulita for a work expenditure bid of \$5,487,626;
- The NEB made two significant discovery declarations in the Sahtu, one in the Colville Hills and the other at Nogha;
- The NEB was also reviewing an applications for significant discovery around Lac Maunoir near the Colville Hills;
- 5 geophysical field operations took place.

Comparative and qualitative hydrocarbon potential maps of the Sahtu have been published by the NWT Geoscience Office to illustrate relative hydrocarbon potential in the Mackenzie Valley.¹¹⁷ This work was done to in support of the NWT Protected Areas Strategy 5-year (2004-2009) Action Plan, to identify potential areas for conservation based on ecological value.¹¹⁸

Areas with high hydrocarbon potential in the Sahtu can be found around Norman Wells, within the Mackenzie Plain and in the Keele Arch area of Colville Hills. The total discovered recoverable oil and gas resources for the Sahtu Settlement Area has been identified as 301.6 million barrels of oil and 832.4 billion feet³ of natural gas.¹¹⁹ To date there are four discovered gas fields and one oil field. The four discovered gas fields are located in the Keele Arch area of Colville Hills, at Tedji Lake, Tweed Lake, Bele, and Nogha. Together they represent total recoverable gas resources of 832.4 billion feet³.¹²⁰ See Map 36. Oil and Gas Potential.

The newest call for bids parcel (due to close July 6, 2010) is located south of Colville Lake between Lac Belot and Lac des Bois, on Sahtu Lands. See Map 37. Oil and Gas Rights.

The NWT Geoscience Office released the Peel Plain and Plateau Geological Atlas in 2009 to provide insight into non-quantitative petroleum plays. It illuminates petroleum potential better than resource modeling analysis: http://gateway.nwtgeoscience.ca/browseC.php?R_ID=16521 and http://gateway.nwtgeoscience.ca/browseC.php?R_ID=16501

¹¹⁴ Economic Review Northwest Territories, 2009. (September 2009) GNWT, Industry Tourism and Investment (ITI), P. 16

¹¹⁵ Ibid, P. 16

¹¹⁶ Ibid, P. 16

¹¹⁷ Gal, L.P. and Udell, A.J., 2005. Compiled Hydrocarbon Play Polygons for mainland Northwest Territories, ArcView .shp format files: Sahtu Settlement Area, Gwich'in Settlement Area, mainland Inuvialuit Settlement Region, Dehcho territory; Northwest Territories, Canada; Northwest Territories Geoscience Office NWT Open Report 2005-004

¹¹⁸ ibid

¹¹⁹ Drummond Consulting, 2008, Ultimate Oil and Gas Resource of the Sahtu and Gwich'in Settlement Areas, http://www.drummondconsulting.com/GS_TOC.pdf

¹²⁰ ibid

Map 36. Oil and Gas Potential

Map 37. Oil and Gas Rights

*Right Issuance Process*¹²¹

In the NWT, the process for getting rights to explore for oil or gas on Crown lands is called the Rights Issuance Process. INAC issues these rights. The Minister decides the areas where Rights Issuances will occur every year.

When the Minister has decided that there will be a Rights Issuance Process, it is carried out in the four steps detailed in Table 15.

Table 15. Oil and Gas Rights Issuance Process in the NWT

The Rights Issuance Process	
Step 1	Consultation and Request for Comment <ul style="list-style-type: none">▪ Aboriginal communities and designated Aboriginal organizations are consulted so they know which areas are being considered for oil and gas exploration
Step 2	Call for Nominations <ul style="list-style-type: none">▪ Companies can nominate areas they want to work in to try to get these areas included in the call for bids▪ A Call for Nominations is usually open for about 30 to 90 days▪ Unique or sensitive areas can be excluded from the nomination
Step 3	Call for Bids <ul style="list-style-type: none">▪ The Crown considers the nominations it received then issues a Call for Bids<ul style="list-style-type: none">○ The only criteria for choosing a winner is the total dollar value of work○ The bid includes a “work proposal” detailing: total amount of money that will be spent, work that will be undertaken, the timeframe▪ Calls for bids are open for a minimum of 120 days▪ There is a minimum bid for each region and a maximum parcel size
Step 4	Issuing the Exploration Licence (EL) <ul style="list-style-type: none">▪ The highest bidder receives the Exploration Licence (EL)▪ A 25% deposit of the total bid amount is held by the Crown as security

Licences and Applications for Oil and Gas Development

The following licences may be granted on a parcel of Crown Land. This is an attempt to explain the general progression of rights from exploration to extraction of oil and gas resources. See Figure 8. Rights Management Process.

¹²¹ SLUPB CAPP Summary Meeting Notes, July 22, 2009

Northern Oil and Gas Annual Report 2008, INAC

Oil and Gas Approvals in the Northwest Territories – Sahtu Settlement Area, The Regulatory Roadmaps Project, 2002

Oil and Gas A Citizen’s Guide for the Northwest Territories 2009, INAC, Petroleum Development Division, Yellowknife, Northwest Territories

Table 16. Stages of Oil and Gas Exploration and Development

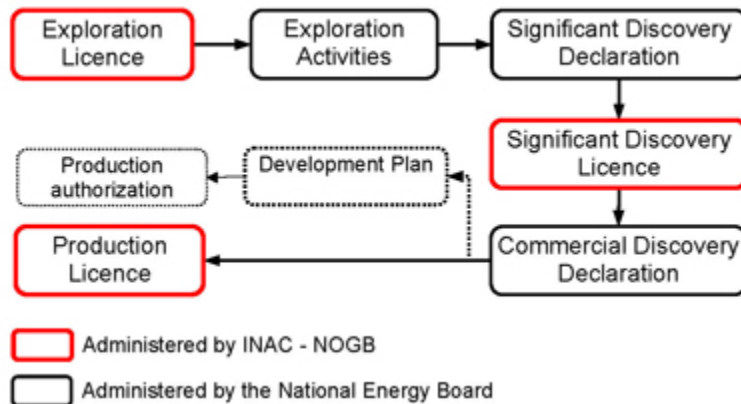
Licences & Applications	Stages of Oil and Gas Exploration and Development
<p>Exploration Licence (EL)</p> <p>Duration: 8-9 yrs (in 2 terms)</p>	<ul style="list-style-type: none"> ▪ ELs give a company: <ul style="list-style-type: none"> ○ the right to explore, the exclusive right to drill and test for oil and gas ○ the exclusive right to develop lands for oil and gas ○ the exclusive right to obtain a Production Licence <p>Term 1</p> <ul style="list-style-type: none"> ○ At the end of the Term 1 (4-5 years) the proposed dollar value of work must be spent and 1 well must be drilled to continue into Term 2 ○ It can cost \$10-15 million to drill a single well in the north. <p>Term 2</p> <ul style="list-style-type: none"> ○ The company pays rental costs to the Crown in \$/ha ○ Further work is not required but a company may chose to continue to do seismic and drill wells <ul style="list-style-type: none"> ▪ If a well is dry the company can relinquish its EL with no penalty (assuming that it has already spent its work commitment)
<p>Significant Discovery Declaration (SDD)</p>	<ul style="list-style-type: none"> ▪ If the company makes a find, it sends a Significant Discovery Application (SDA) to the National Energy Board (NEB) ▪ Upon approval, the NEB issues a Significant Discovery Declaration (SDD) ▪ The Crown issues the Significant Discovery Licence (SDL)
<p>Significant Discovery Licence (SDL)</p> <p>Duration: can be held in perpetuity</p>	<ul style="list-style-type: none"> ▪ Once an SDL is issued, a company stops paying rent ▪ There is no time limit on an SDL – it can be held in perpetuity ▪ A Significant Discovery Licence (SDL) gives a company: <ul style="list-style-type: none"> ○ the right to explore, the exclusive right to drill and test for oil and gas ○ the exclusive right to develop lands for oil and gas ○ the exclusive right to obtain a Production Licence
<p>Commercial Discovery Declaration (CDD)</p>	<ul style="list-style-type: none"> ▪ When a company intends on producing oil or gas from their discovery it files a Commercial Discovery Application (CDA) with the NEB ▪ The NEB makes a commercial discovery declaration (CDD) ▪ INAC issues a Production Licence (PL)
<p>Production Licence (PL)</p> <p>Duration: 25 yrs, renewable</p>	<ul style="list-style-type: none"> ▪ The Production Licence (PL) allows the company to sell the product <p>PLs are valid for 25 years and are renewable</p> <p>A Production Licence (PL) gives a company:</p> <ul style="list-style-type: none"> ○ the right to explore, the exclusive right to drill and test for oil and gas ○ the exclusive right to develop lands for oil and gas ○ the exclusive right to produce from those lands ○ title to petroleum produced

Sources: SLUPB's CAPP Meeting Summary Notes, July 22, 2009

Northern Oil and Gas Annual Report 2008, INAC

Oil and Gas Approvals in the Northwest Territories – Sahtu Settlement Area, The Regulatory Roadmaps Project, 2002

Figure 8. Rights Management Process



3.1.2 Minerals and Mining

The Sahtu region covers an immense area with diverse geological attributes and an equally diverse collection of mineral prospects and deposits.

Mining and mineral exploration have taken place in the eastern part of the GBLW since at least 1930. Eldorado was the NWT's first modern mining operation. It opened in 1933 producing radium, then uranium and many years later, silver. Other mines have followed, producing mostly diamonds, gold, and uranium. Port Radium, Eldorado, Echo Bay, Contact Lake, Terra, Northrim, Norex and Smallwood Lakes are some of the other mines that existed off Great Bear Lake. Today they are no longer operational. There are currently no producing mines in the Sahtu Settlement Area (SSA).

In the last decade or so diamond production started taking place in the NWT. It has been a significant economic driver. In 2006, diamond production in the NWT ranked Canada third in world production, after Botswana and Russia.¹²² In 2008, mines accounted for a monthly average of 2,300 directly related jobs, representing about 10% of all jobs in the territory.¹²³ The introduction of mineral exploration and mining into the economics of the NWT has resulted in enhanced infrastructure (eg. winter or all-weather roads, airstrips, power dam). In addition to direct benefits such as employment in the mining industry, the sector has resulted in spin-off benefits such as indirect employment and contributions to communities through Access and Benefit Agreements.

A number of activities are occurring in the Sahtu even though there are no current active mines:

- the North American Tungsten mine at MacMillan Pass (MacTung) on NWT/Yukon border is in feasibility stage, and
- the Selwyn project south of MacTung is in the Environmental Assessment stage with the Mackenzie Valley Environmental Impact Review Board (MVEIRB)

¹²² Economic Review Northwest Territories. 2009 (March 2009). GNWT, Industry, Tourism and Investment (ITI).

¹²³ *ibid*

A number of other companies are doing work in the Sahtu Settlement Area:

- Sanatana Diamonds north of Great Bear Lake,
- EaglePlain Resources is doing work in the Mackenzie Mountains, and
- Alberta Star on the southeast side of Great Bear Lake.

Geological mapping of mineral potential is not as easily modelled as hydrocarbon potential. Upon consultation with the NWT Geoscience Office, the SLUPB has chosen to rely on a known metallic mineral commodity occurrence map provided by the Office. See Map 38. Known Mineralization in the SSA. It is generally held that there is significant mineral potential within the Mackenzie Mountains. Tungsten, emeralds and other minerals have been discovered within the SSA.¹²⁴

A number of active mineral claims and leases exist on Great Bear Lake next to the closed mines. The chances of further findings in the area are relatively high and exploration continues. See Map 39. Mineral .

It may take years for a mine to be built and despite the number of companies that are active in the area, few prospecting permits will find something worth going to lease. According to INAC's Regulatory Road Map to Mineral Exploration and Development in the NWT, about 3% of an area covered by a prospecting permit will be staked as a mineral claim. Of active mineral claims:

- 60% lapse after 1 year;
- 80% lapse within 5 years; and
- Of those that last longer than 5 years, only 1% will go to lease.

INAC geology tracked a minimum of 2,400 exploration projects between 1971-2007. Four mines resulted from these projects (Cantung E Zone, Ekati, Diavik and Snap Lake). Approximately 30-40 projects remain in "advanced exploration", meaning that extensive surface drilling or underground exploration has occurred.

Geology and Metallic Minerals¹²⁵

A) Bear Province Mineral Values

1) Great Bear Magmatic Zone

There are two significant past-producing mining regions in the Great Bear magmatic zone:

- Silver Bear region, including the Terra and Norex mines;
- Echo Bay region, which includes Eldorado, El Bonanza, and Contact Lake mines.

This region also hosts a number of mineral prospects or showings. Many of these including the past-producing mines, are considered part of the iron oxide copper-gold-porphyry-five-element-vein (epithermal) spectrum of deposits.

¹²⁴ Sahtu Profile, ITI, GNWT: <http://www.iti.gov.nt.ca/about-iti/sahtu/profile.shtml>

¹²⁵ Courtesy of NWT Geoscience Office, Luke Ootes, Metallogenist, Yellowknife

Map 38. Known Mineralization in the SSA

Map 39. Mineral Rights

These types of deposits can contain:

- silver and uranium;
- low-grade copper (less than about 4% copper per tonne of rock);
- significant resources of gold, cobalt, bismuth, zinc, nickel, and lead; and
- accessory vanadium, radium and rare earth elements.

Past-producing mines and a number of known prospects means the geology is favourable for these types of mineralization. The area is accessible by shipping on Great Bear Lake. Extensive past-mining and numerous known mineral prospects suggest that the area is highly prospective for new finds or for advancing known mineral prospects.

2) Coppermine Homocline

The Coppermine Homocline is composed mostly of ancient sedimentary rocks with lesser volcanic rocks that overly or cover the Great Bear magmatic zone.

Known uranium prospects exist in areas such as Caribou Point and the Leith Peninsula. These are of the sandstone-hosted or unconformity-related types and are comparable to the geology of the uranium-rich world-class Athabasca Basin in Saskatchewan. Historical mineral exploration for these types of uranium deposits in this region has not been significant enough to provide further information.

In 2007 detailed mineral exploration led to a new find of diamondiferous kimberlite northeast of Great Bear Lake. This is currently uneconomic to produce diamonds however diamondiferous kimberlite was not thought to occur in this region prior to this discovery. Other diamond prospects are likely to be found in the area. Other mineralization types such as at least one Redbed-hosted copper occurrence and a Platinum Group Element occurrence are known in the region.

[B\) Interior Platform Mineral Values](#)

There are currently no known mineral prospects other than coal in the Interior Platform of the Sahtu, but companies have been actively exploring for diamonds. The lack of known mineral prospects is due to a lack of historical mineral exploration and prospecting.

If mineralization exists, one could expect a Mississippi Valley-type lead-zinc deposit such as that found at Pine Point south of Great Slave Lake using surface and subsurface exploration techniques. A number of other mineralization types could occur in this region but such discoveries have not been made in the Sahtu.

The Interior Platform covers part of the Bear Province. Similar prospects to those in the Bear Province could occur underneath this sedimentary cover. The same can be said for a number of other mineral deposit types (and commodity types), including diamondiferous kimberlite. The general consensus in the mineral industry is that new world-class mineral deposits will be found in areas such as the interior platform.

C) Mackenzie and Selwyn Mountain Mineral Values

A significant number of mineral prospects have been identified in the Mackenzie and Selwyn Mountains. The prospects range from locally observed mineralization to world-class deposits. They can be categorized into at least four distinct mineral deposit types:

1. Redbed or sediment-hosted copper-silver, predicatively hosted in strata that form a north-south belt in the central Mackenzie Mountains.

Eg: Coates Lake (Deh Cho region) is the best known example of this deposit type. The extent of the belt and known occurrences in the Sahtu indicate it could be an attractive exploration area.

2. Carbonate-hosted zinc and lead occur throughout the Mackenzie Mountains. Most of these prospects are structurally-hosted. Predicting where they may occur is generally difficult and requires detailed on-the-ground bedrock mapping and geophysical surveys.

Eg: The Gayna River deposit in the northern part of the Sahtu and the Prairie Creek deposit in the Deh Cho region, currently in the mine planning stage. Prospects of this kind are scattered throughout the Sahtu and more are continually found during periods of active exploration.

3. Shale-hosted zinc and lead occurs within the Selwyn Mountains, near the Yukon border, in the southwestern extent of the Sahtu. These types of deposits generally contain large amounts of zinc. While they are not historically mined, work is in progress in the Yukon to put the Howard's Pass Zn deposit into production.

Eg: Howard's Pass is currently the largest undeveloped zinc deposit in the world. Most work has been completed in the Yukon but geological evidence indicates that this deposit continues into the NWT with potentially significant zinc mineralization in the Sahtu.

4. Skarn-hosted tungsten (and copper, zinc) deposits and prospects are in the Selwyn Mountains, usually within the vicinity of the Yukon border.

Eg: Cantung, in the Deh Cho region is currently the western world's largest producer of tungsten. The mine is on-again, off-again depending on global market conditions for tungsten. The Mactung deposit in Yukon is the western world's largest tungsten deposit. It is currently in the mine planning phase. Parts of the deposit continue into the Sahtu.

Other deposits in the Sahtu portion of the Mackenzie Mountains include: emerald mineralization near Mountain River and the possibility of other gemstone discoveries. Much remains unknown as few areas of the mountains have been explored or prospected.

Stages of Mineral Exploration and Development

The process of mining in the Sahtu is subject to the *Northwest Territories & Nunavut Mining Regulations* (established under the *Territorial Lands Act* and administered by INAC) as well as

the *Sahtu Dene and Métis Land Claim Agreement (SDMCLCA)*. INAC identifies five distinct phases of mining as described in Table 17.¹²⁶

Table 17. Five Stages of Mineral Exploration and Development

Stages of Mineral Exploration and Development	Description
<p>Stage 1: Prospecting & Exploration</p> <p>Cost: About \$1.75 million/project/yr</p> <p>Duration: 3-5 yrs</p>	<p>The search for mineral deposits has the highest financial risk but is the least expensive and involves activities with minimal impacts. Activities include:</p> <ul style="list-style-type: none"> ▪ office work, legal and political analysis; ▪ airborne and satellite survey and data collection; ▪ geological and geophysical prospecting and surveys on the ground; ▪ trenching, cutting line grids, claim staking; ▪ detailed mapping, drilling ground surveys, initial environmental baseline work. <p>Once a mineral claim or lease is obtained, more intensive and expensive exploration work will occur to identify a mineral deposit.</p>
<p>Stage 2: Discovery & Advanced Exploration</p> <p>Cost: About \$5 million /project/yr</p> <p>Duration: 5-15 yrs</p> <p>Success: 1 out of 200 go to Development</p>	<p>At this stage permits, leases and licences are required and a project may be referred for environmental assessment. Most projects never get past this stage. In the case where a mine does develop it may take 10-15 years or more.</p> <p>In the North operational challenges such as limited infrastructure (ie. roads, power) the cost of fuel and transportation, materials and labour may impose even greater barriers than usual.</p> <p>Activities include:</p> <ul style="list-style-type: none"> ▪ mapping, underground sampling, drilling, small-scale open pits or on-site processing facilities, environmental site survey; ▪ pilot tests and engineering, cost estimates; ▪ market studies and risk analysis; ▪ due diligence review, evaluation of geological, engineering, environmental, economic, legal and site data.
<p>Stage 3: Development/ Construction</p> <p>Cost: Can range from \$500 million to \$1.5 billion</p>	<p>This is the most costly phase of the mining cycle. At this stage the company raises money for mine construction and development.</p> <p>A company will commit to construction once all the details of the permitting and regulatory requirements are known. The feasibility study is returned to the company stakeholders for approval. This may take several years especially if there are significant changes.</p>

¹²⁶ Citizen's Guide to Mining in the NWT 2006, Mineral and Petroleum Resources Directorate, Minister of Indian Affairs and Northern Development, Catalogue No. R2-321/2006E. Regulatory Road Map to Mineral Exploration and Development in the Northwest Territories, Indian and Northern Affairs Canada, Catalogue No. R2-465/2007 or online Catalogue No. R2-465/2007E-PDF

Duration: 3-5 yrs or more	
Stage 4: Operation & Production Cost: Companies begin to make a return on their investment	Mining companies consider a 10-year life to allow adequate time to recover exploration and construction expenses. The lifespan of a mine depends on the amount (reserves) and quality (grade) of the mineral, metal or gems and whether operation is still profitable. Activities include: <ul style="list-style-type: none"> ▪ surface and/or underground mining, milling, and processing of metal, ore or diamonds; ▪ environmental monitoring.
Stage 5: Reclamation Cost: upwards of \$150 million Duration: 2-10 yrs or more	All existing and new mines in the NWT must have closure and reclamation plans and are required to set aside in a trust the total estimated reclamation costs. Activities include: <ul style="list-style-type: none"> ▪ Environmental restoration and monitoring.

Source: Citizen's Guide to Mining in the NWT 2006, INAC, Mineral and Petroleum Resources Directorate

Stages of Mineral Exploration & Development in the Northwest Territories, INAC Catalogue No. R2-466/2007

Licences and Applications

The NWT/Nunavut Mining Regulations operate under a "free entry system." Any person with a prospecting permit can stake a claim. Prior consultation with First Nations or the public is not necessary before a proponent can explore or before Canada grants a permit or claim. The lack of consultation has at times been an issue for First Nations who object to this system.

As per S 21.4.6 (b) of the Sahtu Dene and Métis Comprehensive Land Claim Agreement, persons who have a right to prospect for minerals and to locate claims who do not require a land use permit or water licence can have access to Sahtu Lands and waters provided that they notify the designated Sahtu organization at least seven days in advance.

Table 18. Licences and Applications for Mineral Exploration and Development

Licences and Applications	Description
Prospecting Permit	<ul style="list-style-type: none"> ▪ Anyone with a valid prospector's licence can apply for a prospecting permit which gives them the exclusive right to explore for and stake mineral claims in a specific area for a period of 3-5 years. ▪ During this time a minimum amount of work (with a specific dollar value) must be done.
Staking a Claim	<ul style="list-style-type: none"> ▪ Individual mineral claims may not be larger than 2,582.5 acres and last a maximum of 10 years. ▪ Work must be done on mineral claims to keep them valid. The minimum work to be done is calculated per acre.
Mineral Leases	<ul style="list-style-type: none"> ▪ Holders of a mineral claim can apply for a Mineral Lease if they have done the required work - calculated at a minimum of \$10 per acre. ▪ A legal survey by the Dominion Land Surveyor must also be completed. ▪ Leases have to be obtained prior to "production" of mineral interests.

3.1.3 Granular Deposits¹²⁷

Natural Resources Canada has mapped the distribution and thickness of potential surface and subsurface granular aggregate resources in the NWT. Gravel, sand, crushed rocks and bedrock are all different types of granular aggregate used by proponents on the land. Granular resources are crucial to the development of infrastructure such as roads, airstrips, petroleum wells, building pads, pipelines and concrete production.

The data was collected mostly in the 1960s and early 1970s by the oil and gas industry. During seismic operations, shotholes are drilled into the ground to set charges which produces seismic data. Operators logged the material they were drilling through and gravel was a sediment layer that was well recorded. In British Columbia, shothole records were found to be an effective method to identify potential granular aggregate deposits.

The data identifies a number of potential granular aggregate deposits as "gravel", "gravel and sand", or "sand" and distinguishes deposits which occur at the surface or in the subsurface. Bedrock, particularly competent sandstone and limestone were not included in the analysis. There may be depth estimate errors and location uncertainties. Thickness and vertical depths of the potential deposits are approximations. In terms of location it is not clear whether the sites were marked by latitude and longitude or simply hand drawn on the maps.

Although they are reasonably reliable, the shothole records should be treated as potential occurrences and ought to be exploration targets before they are integrated into resource assessments and development strategies. See Map 40. Granular Deposits for locations.

The GNWT created a Granular Resource Directory (GRD) as part of a territory-wide granular strategy committed to conservation, sustainability and effective management of the resources

¹²⁷ Natural Resources Canada, Geological Survey of Canada, Discussion: GSC Open File 6058

Map 40. Granular Deposits

in the NWT.¹²⁸ The Directory is intended to provide guidance in the identification, acquisition, usage and management of these strategic and valuable resources. The effective management of these resources will allow for future infrastructure development by communities, government and for industry.

The GNWT Directory can be accessed on-line at:

http://www.maca.gov.nt.ca/resources/Granular_Resource_Directory_March_2009/GNWT_GRD_March_2009.pdf

3.1.4 Contaminated Sites and Waste Remediation

There are a number of contaminated sites in the SSA and in some cases waste remediation projects are underway. A number of contaminated sites are left on the eastern shore of Great Bear Lake from past mines. Other sites are located along the Mackenzie River. Over the years the river was used as a transportation corridor and waste has accumulated in some areas.

Contaminated sites and remediation were a focus in the Great Bear Lake Watershed Management Plan ("GBLWMP). The Sahtugot'ine, or the people of Déline have depended on the Great Bear Lake Watershed (GBLW) to meet their social, cultural and economic needs for generations. Abandoned mine and waste sites, garbage and sewage from camps, lodges, and the town of Déline can be potential threats to the health of the GBLW. Keeping the waterbodies and watersheds clean is of high priority as people continue to rely on the Mackenzie River and Great Bear Lake for their food, transportation, as their water source and for recreational activities. Communities have serious concerns about the potential health and ecological impacts of contaminated and abandoned sites. They fully support clean up and remediation efforts.

When a site is abandoned on Crown Lands, the federal government becomes responsible for contaminated and waste sites. The Contaminated Sites Management Policy (2002) guides INAC's approach to the remediation of abandoned contaminated and waste sites North of 60. This commits the Department to manage "contaminated sites in a cost effective and consistent manner, to reduce and eliminate, where possible, risk to human and environmental health and liability associated with contaminated sites."

INAC manages contaminated sites by following the Treasury Board's *Federal Contaminated Sites Management Policy*, and by using the recommended guidelines and standards set by the Contaminated Sites Management Working Group, the Canadian Council of Ministers of the Environment and the Canadian Standards Association.

In setting remediation priorities among contaminated sites, INAC uses the following criteria and a risk management framework:

- human health and safety;

¹²⁸ Prepared by The Interdepartmental Granular Committee with representatives from Department of Public Works and Services, Department of Municipal and Community Affairs, Department of Transportation, NWT Housing Corporation. Northwest Territories Granular Resource Directory – Territorial Granular Strategy. March 2009.

http://www.maca.gov.nt.ca/resources/Granular_Resource_Directory_March_2009/GNWT_GRD_March_2009.pdf

- legal and claims obligations;
- significant impacts on the environment; and
- concerns of First Nations, Inuit, northerners and other stakeholders.

The approach determines which sites receive funding during the annual planning cycle. Risk management is used to prioritize sites therefore sites closer to larger human population centres generally receive remediation priority.

In the past, this has hindered the remediation of sites in the SSA. The *Federal Contaminated Sites Management Policy* outlines the methodology for setting remediation objectives. INAC will take into account the concerns of Sahtu authorities and regulators in selecting the appropriate method for establishing remediation objectives. INAC will, for example, take into account any site conditions that are unique or particularly sensitive, and the impact of any potential residual contamination on traditional lands and lifestyles.

The Northern Affairs Program at INAC maintains a database of contaminated sites, which defines sites, lists physical hazards to human health and safety, and quantifies liabilities. This database is used primarily for project planning and funding, and is a valuable resource for those sites that have received funding.

Information on documented contaminated and waste sites in the NWT is currently stored in the INAC's Contaminated and Waste Sites Database. The Database is a compilation of information from INAC's land use inspectors, other INAC personnel and community representatives. It may, however, be incomplete. The listed sites range from the high-priority former Port Radium mine site, to low-priority former blasting sites, to old fuel caches with scrap metal and drums.

See Table 19. Contaminated Sites in the SSA

See Map 41. Contaminated Sites

3.1.5 Forestry

As per Chapter 14 of the SDMCLCA, the harvest of timber for personal use is permitted year-round. The Forest Management Department within ENR has authority for granting forest authorizations for domestic, commercial, and incidental harvest of timber on commissioner or crown lands. The Forest Management Department does not have authority over private or selected lands but it can issue timber transport permits to the land owner. The Land Corporation retains the authority to grant access to its lands and timber by issue of load tickets to harvesters.

Large scale commercial forestry does not currently take place in the Sahtu nor are there immediate plans to undertake such developments. Small scale commercial transactions occur in the form of payments from one individual to another for labour associated with the harvest of timber for domestic use.

Table 19. Contaminated Sites in the SSA

#	Site Name	#	Site Name
1	AIRPORT CREEK	41	MACKENZIE RIVER SHORELINE # 16
2	ANDERSON RIVER/BLUENOSE LAKE A	42	MACKENZIE RIVER SHORELINE # 17
3	BEAR ROCK /MIRROR LAKE #1	43	MACKENZIE RIVER SHORELINE # 18
4	BLUEBERRY CRK/BEAR ROCK #4	44	MACKENZIE RIVER SHORELINE # 19
5	BLUEFISH CRK/BEAR ROCK #3	45	MCCLURE LAKE (2 OF 7 LAKES)
6	Canol - Mile 76	46	MIRROR LAKE/BEAR ROCK PROJECT
7	Canol - Mile 108	47	MOOSE LAKE
8	Canol - Mile 80	48	MOUNTAIN LAKE (1 OF 7 LAKES)
9	COLVILLE LAKE # 08	49	NORMAN WELLS RIVERBANK CLEANUP
10	COLVILLE LAKE # 09	50	SLIDE LAKE (6 OF 7 LAKES)
11	COPPERMINE TRAIL	51	SVEN LAKE (4 OF 7 LAKES)
12	SANS SAULT / EAST MOUNTAIN AREA	52	UNNAMED LAKE/COLVILLE LAKE (3)
13	ESTABROOK LAKE/COLVILLE LAKE	53	UNNAMED LAKE/COLVILLE LAKE (4)
14	FLORENCE LAKE	54	WINDY ISLAND B - 53/BEAR ROCK
15	FORT GOOD HOPE AREA (2 SITES)	55	YELLOW LAKE
16	GASSEND LAKE/COLVILLE LAKE (5)	56	CLOUD DOH (GREAT BEAR LAKE)
17	GUBER LAKE (5 OF 7 LAKES)	57	GOOD HOPE BAY/GREAT BEAR LAKE
18	HORTON LAKE # 1	58	GREAT BEAR L # 1/GREAT BEAR R.
19	HORTON LAKE # 2	59	NORMAN WELLS/40 KM NORTH
20	HORTON LAKE # 3	60	SHEZAL CANYON
21	HUME RIVER/TRIAD BP ARCO CC HU	61	POINT LAKE
22	LAC BELOT # 1/COLVILLE LAKE	62	PORT RADIUM MINE/ELDORADO MINE
23	LAC BELOT # 1/COLVILLE LAKE	63	SAWMILL BAY/GREAT BEAR LAKE
24	LAC CHARRUE/LITTLE CHICAGO	64	SILVERBEAR / TERRA # 1
25	LAC MAUNOIR/COLVILLE LAKE	65	SILVERBEAR / TERRA # 2
26	LITTLE CHICAGO # 1	66	SILVERBEAR / TERRA # 3
27	LITTLE CHICAGO # 2	67	SILVERBEAR / TERRA # 4
28	MACKENZIE RIVER SHORELINE # 01	68	BIG DAL LAKE (4 OF 4 SITES)
29	MACKENZIE RIVER SHORELINE # 03	69	DIVIDE LAKE (2 OF 4 SITES)
30	MACKENZIE RIVER SHORELINE # 04	70	DRILL LAKE (2 SITES)
31	MACKENZIE RIVER SHORELINE # 05	71	GODLIN LAKE
32	MACKENZIE RIVER SHORELINE # 06	72	JUNE LAKE (LOWER)
33	MACKENZIE RIVER SHORELINE # 07	73	JUNE LAKE (UPPER)
34	MACKENZIE RIVER SHORELINE # 09	74	KEELE RIVER AIRSTRIP
35	MACKENZIE RIVER SHORELINE # 10	75	NATLA LAKE (1 OF 4 SITES)
36	MACKENZIE RIVER SHORELINE # 11	76	SHELL CLOVERLEAF I-46
37	MACKENZIE RIVER SHORELINE # 12	77	CONTACT LAKE MINE
38	MACKENZIE RIVER SHORELINE # 13	78	EL BONANZA MINE
39	MACKENZIE RIVER SHORELINE # 14	79	FORT CONFIDENCE
40	MACKENZIE RIVER SHORELINE # 15	80	DAHADINNI RIVER M-43 A

Map 41. Contaminated Sites

3.1.6 Fishing

Commercial fishing does not currently take place in the Sahtu Settlement Area.

There is limited practice of sport fishing as a tourism activity, as described above. Subsistence fishing however, has been practiced in the Sahtu at numerous locations such as in fish lakes, in Great Bear Lake, along the Mackenzie River and in its tributaries. Fish lakes have been an important source of food for families and in some circumstances they have allowed families to endure difficult times when hunting was poor. Some fish lakes are of significant cultural importance because they have allowed families to endure times of near starvation.¹²⁹ The community of Déline continues to practice subsistence fishing on Great Bear Lake and the other Sahtu communities continue to use the fish lakes, the Mackenzie River and other water bodies as a food source year-round.

The economic value of fish has not been quantified as a dollar value but the use of fish as a traditional food is widely known to be of importance for the people of the Sahtu. Fish are an important part of the traditional diet.

3.2 TOURISM

In 2002-2003, roughly 59,000 vacationers and business travellers spent \$93 million on NWT goods and services.¹³⁰ Over half of the vacationers came from Canada, mostly Alberta, British Columbia and Ontario. After mining and oil and gas, tourism is the territory's third largest sector of the economy. Tourism contributes more to the NWT economy than the combined sales of agriculture, forestry, fishing, and trapping. It is the territory's largest renewable resource industry.¹³¹

In 2006, the NWT had 35,956 travellers of which 6,004 came to the Sahtu Settlement Area (SSA). Almost 50% of these visitors came for the purpose of business. About 21% visitors came for the purpose of fishing and roughly 4% for hunting, 4% for touring and 5% for outdoor adventure.¹³²

Summer visitors spend the least on a per person basis compared to other leisure segments. They make up approximately 60% of non-business visits to the territory but account for 39% of the spending.¹³³

The Sahtu is an attractive destination in the country for visitors who are seeking a wilderness experience in a remote, pristine landscape or for those looking for impressive hunting and

¹²⁹ Personal Communication, Fort Good Hope elder, June 2009.

¹³⁰ Tourism Profile, 2005, ITI, GNWT:

<http://www.iti.gov.nt.ca/publications/2007/BusinessEconomicDevelopment/tourism2005.pdf>

¹³¹ Tourism Profile, 2005, ITI, GNWT:

<http://www.iti.gov.nt.ca/publications/2007/BusinessEconomicDevelopment/tourism2005.pdf>

¹³² Tourism Strategy for the Sahtu Region, Final Report, September 15, 2008, Terriplan Consultants, ITI, GNWT

¹³³ Tourism Profile, 2005, ITI, GNWT:

<http://www.iti.gov.nt.ca/publications/2007/BusinessEconomicDevelopment/tourism2005.pdf>

fishing opportunities. In its 2004 Strategic Plan, the GNWT identified the expansion of tourism in the NWT as one of its key priorities (Tourism 2010).¹³⁴ In the 2007 Budget the territorial government again identified tourism as a sector with opportunities for economic diversification and potential to increase community-level economic participation. As a result, "A Tourism Strategy for the Sahtu Region" final report was published in September 2008.

The GNWT is trying to increase tourism by funding marketing research, tourism training, infrastructure, and product development. Despite a number of challenges such as the high cost of air travel, lack of direct charter flights from Europe, high operating costs, the need for infrastructure and difficulty of recruiting and retaining employees, the "Sahtu Regional Tourism Strategy" (Terriplan, 2008) focuses on a number of opportunities for tourism development.¹³⁵

Some major tourism assets of the Sahtu include:

- the Canol Heritage Trail,
- sport fishing on Great Bear Lake,
- the Mackenzie River and mountains,
- the Keele River,
- Horton Lake,
- Bear River, and
- Saoyu-?ehdacho National Historic Site, established in the spring of 2009.

The tourism industry would like to see the wilderness aspect of the Sahtu maintained. The remoteness and perceived pristine nature of the environment is a major factor in ecotourism, guiding and outfitting activities. This includes the need for buffer zones around cabins and campsites, rotating harvest as part of a conservation strategy, protecting wildlife during birthing seasons and securing adequate harvest levels to maintain and grow the industry.¹³⁶

3.2.1 Big Game and Sport Fishing Outfitters

Big game and sport fishing outfitters are a significant part of the wilderness related tourism industry in the Sahtu Settlement Area (SSA). They are permitted and subject to necessary regulatory approvals.

The Mackenzie Mountains of NWT were first opened to non-subsistence hunters, or trophy hunters, in 1965. The Association of Mackenzie Mountains Outfitters (AMMO) is an 8 member association of the Outfitters that have been given exclusive privilege to provide outfitting services for non-resident hunting within their outfitting zone. Under the terms of the NWT Wildlife Act, each licensed outfitter is licensed by the GNWT to provide outfitting services within their zone.¹³⁷ See Map 42. Outfitting Regions and Tourism Establishments.

¹³⁴ Tourism 2010, A Tourism Plan for the Northwest Territories, ITI, GNWT:
http://www.iti.gov.nt.ca/publications/2007/TourismParks/Tourism_2010.PDF

¹³⁵ Excerpted from Tourism Strategy for the Sahtu Region, Final Report, September 15, 2008, Terriplan Consultants, ITI, GNWT

¹³⁶ From May 31, 2007 comments from the Association of Mackenzie Mountain Outfitters, Available at:
<http://www.sahtulanduseplan.org/website/web-content/index.html>

¹³⁷ Excerpted from Association of Mackenzie Mountain Outfitters website: <http://huntnwt.com/index.html>

Map 42. Outfitting Regions and Tourism Establishments

All non-residents of the NWT are required to use the services of an outfitter and be accompanied by a licensed guide at all times while hunting. Non-resident hunters must be at least 16 years of age and are required to purchase a hunting license.¹³⁸

The license provides for the take of one of each big game species a year:

- 1 Dall's sheep ram (with at least $\frac{3}{4}$ curl horns);
- 1 woodland caribou (either sex);
- 1 moose (either sex);
- 1 mountain goat (either sex);
- 1 wolf (either sex);
- 1 wolverine (either sex); and
- 1 black bear adult not accompanied by cubs.¹³⁹

Grizzly bear hunting for non-residents was eliminated in 1982. For residents, grizzly bear hunting is restricted to one adult grizzly per lifetime and the bear must not be accompanied by a cub.

Approximately 330 non-resident hunters visit the Mackenzie Mountains from July to August. Within the NWT, big game hunters are mostly American. They account for only 3% of leisure visitors by number but contribute 37% of the total in spending generated by non-business tourism.¹⁴⁰

The outfitting industry employs 100-120 outfitters, guides, pilots, camp cooks, camp helpers and horse wranglers per year. Meat from many of the harvested animals is given to the local communities for distribution.¹⁴¹

3.2.2 Sport Fishing and Ecotourism

Sport fishing can take place as a tourism activity on Great Bear Lake and along the Mackenzie and some of its tributaries. Some outfitters also have sport fishing lodges. Although the potential exists for the development of a sport fishing industry it is not much practiced in the SSA.

Ecotourism is another identified tourism product that has not been widely promoted or offered. A number of opportunities exist for ecotourism including paddling down the Mackenzie River or some of its main tributaries such as the Keele River, hiking the Canol Trail, and wilderness hiking in the Mackenzie Mountains.

There will be further opportunities to increase the outdoor tourism market as Shúhtagot'ine Néné, Nááts'ihch'oh and Ts'ude niline Tu'eyeta (The Ramparts) become established as protected areas through the NWT Protected Areas Strategy (PAS). Now that Saoyú - ?ehdacho are established National Historic Sites they may develop other opportunities.

¹³⁸ Association of Mackenzie Mountain Outfitters website: <http://huntnwt.com/index.html>

¹³⁹ *ibid*

¹⁴⁰ Tourism Profile, 2005, ITI, GNWT:

<http://www.iti.gov.nt.ca/publications/2007/BusinessEconomicDevelopment/tourism2005.pdf>

¹⁴¹ Association of Mackenzie Mountain Outfitters website: <http://huntnwt.com/index.html>

3.3 INFRASTRUCTURE AND TRANSPORTATION

Infrastructure and transportation play significant roles in helping to build a future with economic opportunities. A significant cost of doing business in the north is tied to the lack of infrastructure and transportation options. The oil and gas and mining industries experience higher operating costs in the north due to limited infrastructure. Due to the cost of extraction and transportation, finds are often only economical if they are very large or if they occur in multiples.

It is important to note that infrastructure and transportation options that have been created for industry or by industry can later result in benefits to the communities. Examples of benefits that have been passed on include the winter road, access roads, cut lines that can be used for trapping or hunting and the barge system that now also serves residential demands.

3.3.1 Energy & Power Development

Power in the Northwest Territories is generated primarily through hydro-electric projects (75%) and diesel plants. Within the Sahtu, the four smaller communities use diesel generated power while in Norman Wells, the NWT Power Corp purchases natural gas generated power from Esso to sell to the community. Power can be generated from renewable or non-renewable resources.

*Hydro-Electricity*¹⁴²

The GNWT's 16th Legislative Assembly has set a number of energy priorities to address NWT residents' frustration with the rising cost of energy. The NWT currently relies heavily on imported fossil fuels that are exposure to world oil prices. To address resident frustrations the Legislative Assembly has expressed an interest in pursuing initiatives that will help reduce energy costs and advance the development of alternative energy initiatives. The GNWT has committed to reducing its dependence on imported diesel. It will focus on long-term commitments to developing hydroelectric resources through a NWT Hydro Strategy.

The "Draft NWT Hydro Strategy Executive summary brochure" was released in 2009 outlining the territory's long-term approach to developing hydroelectricity in the territory. The NWT has more than 11,500 megawatts of hydroelectric potential but is currently using less than 0.5% of it. Of this potential, 10,450 megawatts are associated with the Mackenzie River.¹⁴³

The GNWT established the Northwest Territories Hydro Corporation (NT Hydro) and its subsidiary, the NWT Energy Corporation, to realize its development goals. Sahdae Energy Ltd., a subsidiary of the NWT Hydro Corporation, was established to pursue hydro development on Great Bear River to power the potential Mackenzie Valley Pipeline project.¹⁴⁴

The GNWT will lend its support through the development of policy, planning and programs that will be aligned with the strategies and actions. The GNWT recognizes that its hydroelectrical

¹⁴² Personal Communication, Peter Lennie-Misgeld, NT Hydro, February 24, 2010.

¹⁴³ Draft NWT Hydro Strategy, The foundation for a sustainable energy future, Executive summary brochure, 2009, GNWT

¹⁴⁴ Draft NWT Hydro Strategy, 2009, GNWT

Map 43. Hydro-Electric Potential in the Sahtu

development policy and regulations will have to comply with the resource management regimes created by settled land claims such as the SDMCLCA.

The proposed hydroelectricity transmission lines are to roughly follow the Mackenzie River from Hay River through Tulita, Norman Wells, Fort Good Hope and to Inuvik. Déline would connect through Tulita. Colville Lake is not currently shown as a destination for the lines. In the NWT hydro developments will take years to develop. Planning will take place in the next 10 years.¹⁴⁵

See Map 43. Hydro-Electric Potential in the Sahtu

Biomass Energy¹⁴⁶

The “NWT Biomass Energy Strategy” released in 2010, is aimed at promoting the use of wood or wood pellets as an alternative heating source for homes and businesses. The shift towards biomass energy is intended to decrease territorial dependence on imported fossil fuels which have risen in cost over the years and which contribute to greenhouse gas emissions that drives climate change.

Climate change is a serious issue for people of the NWT. As a result the GNWT is promoting the use of wood and wood pellets, or biomass as an alternative and reliable source of heating fuel.

New and efficient technologies have made wood a reliable source of energy for large scale applications. Large wood pellet boilers can heat institutional buildings such as schools and offices. Some boilers can also fuel district heating systems and generate electricity. As mentioned above, there is no commercial forestry in the SSA. Current harvest of timber is only for personal use. The large majority of the timber is used for home heating in wood stoves.

3.3.2 Transportation

Winter Roads¹⁴⁷

The winter road system in the SSA is maintained by the GNWT Department of Transportation (DOT). It provides the only road access in the Sahtu and connects the five communities. It extends down the Valley to Tulita, Norman Wells, Fort Good Hope and ends at Colville Lake. An additional road from Tulita connects to Déline. From the south the winter road connects to Wrigley and on to Yellowknife.

The Norman Wells to Fort Good Hope section of the road has officially been in operation since 1987.¹⁴⁸ The Fort Good Hope to Colville Lake portion has been in operation since 2000-2001.¹⁴⁹

¹⁴⁵ Personal Communication, Peter Lennie-Misgeld, NT Hydro Corporation, February 22, 2010

¹⁴⁶ NWT Biomass Energy Strategy, 2010. GNWT, ENR

¹⁴⁷ GNWT Department of Transportation:

http://www.dot.gov.nt.ca/_live/pages/wpPages/Winter_and_ice_roads.aspx

¹⁴⁸ *ibid*

¹⁴⁹ *ibid*

The winter road system is open from about mid-January to mid-March.¹⁵⁰ Below is a table of the average opening and closing dates. Times are averages over the last 5-25 years (depending on how long the section of the road has been in operation).

To see the winter road route, see Map 44. Existing and Proposed Infrastructure.

Table 20. Mackenzie Valley Winter Road

Winter Road Section	Distance	Max. Load limit (kg)	Opened (ave.)	Closed (ave.)
Wrigley to Tulita	248 km	64,000 kg	January 4	March 24
Tulita to Norman Wells	85 km	64,000 kg	January 6	March 25
Tulita to Déline	105 km	50,000 kg	January 23	March 25
Norman Wells to Fort Good Hope	149 km	64,000 kg	January 1	March 26
Fort Good Hope to Colville Lake	165 km	64,000 kg	January 1	March 29

Mackenzie Valley Highway Extension

In *Investing in Roads for People and the Economy: A Highway Strategy for the Northwest Territories* (2000), the GNWT Department of Transportation expressed interest in improving the health and well-being of individuals and communities in the north by enhancing access to goods, government services and employment through all-weather road access.

Over the years, both the federal and territorial governments have considered building an all-season road down the Mackenzie Valley from Wrigley to Tuktoyaktuk. The road would provide access to communities within the Mackenzie Valley and Delta and facilitate the development of resources, such the Mackenzie Gas Project.

In 1989 the GNWT Department of Transportation (DOT) took over responsibility for maintenance, operation and reconstruction of existing highways in the NWT. The federal government remains responsible for new road construction.¹⁵¹ No commitments have been made to date but the proposed extension has a similar routing to that of the winter road and includes connections to the current all-weather road network at Wrigley. It would extend 482 km to Fort Good Hope and 832 km to connect with the Dempster Highway.¹⁵² A 105 km spur would connect to Déline.

Expected benefits include lower prices, an increase in tourism, enhanced access to services and improved operating efficiencies. Community concerns include an increase in social problems related to alcohol and drugs. Environmental concerns include potential negative effects on fish and wildlife habitat and populations.¹⁵³

¹⁵⁰ Mackenzie Valley Highway Extension Environmental Scoping Report, 1999

¹⁵¹ *ibid*

¹⁵² D.5 Executive Summary of the Benefit Cost and Economic Impact Analysis, Mackenzie Valley Highway Extension, 1999

¹⁵³ Mackenzie Valley Highway Extension Environmental Scoping Report, 1999

Map 44. Existing and Proposed Infrastructure

Barges

In the summer months (mid-June to late-September) the communities of Tulita, Norman Wells and Fort Good Hope are supplied by a tug and barge service along the Mackenzie River. The barges are owned and run by a private company that ships domestic and commercial items. Cargo service for the Sahtu starts in Hay River and depending on the community, will ship 3-4 times over the course of the summer.¹⁵⁴

The communities of Déline and Colville Lake are not accessible by barge. They are supplied by air and on the winter roads. The stores and residents may take advantage of the barge system to ship items as it is less costly than shipping by air.

Air Travel

The Sahtu is serviced by three private airlines and two charter helicopter companies. North-Wright Airways, headquartered out of Norman Wells is 51% equally owned by the Déline Land Corporation and the Yamoga Land Corporation and 49% privately owned.¹⁵⁵ Its fleet of 21 single and twin-engine fixed wing aircraft mounted on wheels, skis, floats or tundra tires.¹⁵⁶ Scheduled service is offered for passengers and freight with connecting jet service by Canadian North to Norman Wells, Inuvik and Yellowknife. Thirty-three weekly scheduled flights by North-Wright Airways connect eight communities in and out of the Sahtu.¹⁵⁷ Most scheduled flights into the communities of Tulita, Déline, Fort Good Hope and Colville Lake pass through Norman Wells and connect six days a week, north and south. Small single-engine or twin-engine aircraft offer charter and specialty services.

Ursus is a native owned charter airline based out of Tulita and Yellowknife offering charter service with single, multi, or wheels/floats/ski aircraft.

First Air began offering services out of Norman Wells in June 2010, offering scheduled passenger and cargo service. The aircraft are also available for charter. The company is owned by Makivik Corporation in Kuujuaq, Quebec. Both First Air and Canadian North offer jet service.

Sahtu/Great Slave Helicopters is a charter company servicing the Mackenzie Valley and headquartered in Norman Wells. The company is a joint venture with the Tulita Land Corporation (and other claimant corporations interested) holding equal shares totaling 51% of the company. Great Slave Helicopters retains ownership of the remaining 49% of shares.

Canadian Helicopters is one of the largest helicopter transportation service companies operating in Canada and one of the largest in the world based on the size of its fleet. It has over 40 base locations across Canada including one in Norman Wells. It offers chartered service including emergency medical services, infrastructure maintenance, utilities, oil and gas, forestry, mining and construction. It also operates three flight schools and provides repair and maintenance services.

¹⁵⁴ NTCL website: www.ntcl.com

¹⁵⁵ *ibid*

¹⁵⁶ North Wright Airways: www.north-wrightairways.com

¹⁵⁷ *ibid*

CHAPTER 4: REGULATORY ENVIRONMENT

4.1 MACKENZIE VALLEY RESOURCE MANAGEMENT ACT (MVRMA)

The Sahtu Land Use Plan (SLUP) must be consistent with the *Mackenzie Valley Resource Management Act* (MVRMA) and the *Sahtu Dene and Métis Comprehensive Land Claim Agreement* (SDMCLCA).

To fulfill the requirements of the SDMCLCA, the *Mackenzie Valley Resource Management Act* (MVRMA) was proclaimed on December 22nd, 1998.

The MVRMA implemented the obligations of the SDCLCA by legislating the:

- Sahtu Land Use Planning Board (SLUPB) under Part 2,
- Sahtu Land and Water Board (SLWB) under Part 3,
- Mackenzie Valley Land and Water Board (MVLWB) under Part 4, and
- Mackenzie Valley Environmental Impact Review Board (MVEIRB) under Part 5.

The *Sahtu Dene and Métis Comprehensive Land Claim Agreement* (SDMCLCA) required the establishment of a number of boards as institutions of public government. These boards are part of an integrated and coordinated system of land and water management in the Mackenzie Valley. They set out a new system for managing development in the Sahtu Settlement Area (SSA). The boards regulate all land and water uses, including deposits of waste.

The MVRMA is the primary legislation regulating land and water use within the Mackenzie Valley. It is described as a modern integrated resource management statute that provides for integrated decision making. It requires that first nations, governments and regulatory bodies carry out their powers in accordance with approved land use plans, and that approved recommendations from the environmental impact assessment process be incorporated into licensing and permitting decisions.

Under this new regime, the MVRMA sets procedures for the preliminary screening, environmental assessment and environmental impact review of proposals for land and water use, other than for those few activities exempted under the Act or Regulations (minor uses, emergencies, national security, and those uses approved before 1984). Since most land use activities require either a land use permit or water licence under the MVRMA, in addition to any other authorizations required from other government bodies, this has the effect of coordinating project review between the multitude of federal and territorial departments and agencies involved.

The Mackenzie Valley Land and Water Board (MVLWB) oversees the preliminary screening and regulatory authorization functions (issuance of land use permits and water licences with appropriate terms and conditions) in non-settlement regions while the regional Sahtu Land and

Water Board fulfills this role for applications wholly within the land claim settlement area, in cooperation with the MVLWB in areas of overlap. Projects requiring environmental assessment or environmental impact review are referred to the Mackenzie Valley Environmental Impact Review Board (MVEIRB), which manages those processes.

Section 124 requires that the MVEIRB be notified and a preliminary screening be conducted on every application for a permit, licence or authorization under federal or territorial legislation. Any development proposed by the federal, territorial or the Sahtu First Nations that do not require any authorizations are also subject to preliminary screenings. Activities can be exempted from preliminary screening if they are listed under the Exemption List Regulations or preliminary screening is declared inappropriate for reasons of national security. This section establishes the Sahtu Land and Water Board as the lead preliminary screener in the SSA.

In S. 125(1) if the preliminary screener determines that the development “might have a significant adverse impact on the environment or might be a cause of public concern”, they must refer the proposal to the Review Board for an environmental assessment.

Section S. 126 requires the MVEIRB to conduct an environmental assessment of a proposal referred to them by a preliminary screener, government (federal, territorial or community) or the Sahtu First Nations and allows the Review Board to conduct an environmental assessment of a proposal on its own motion.

See Figure 9. Regulatory Bodies in the SSA.

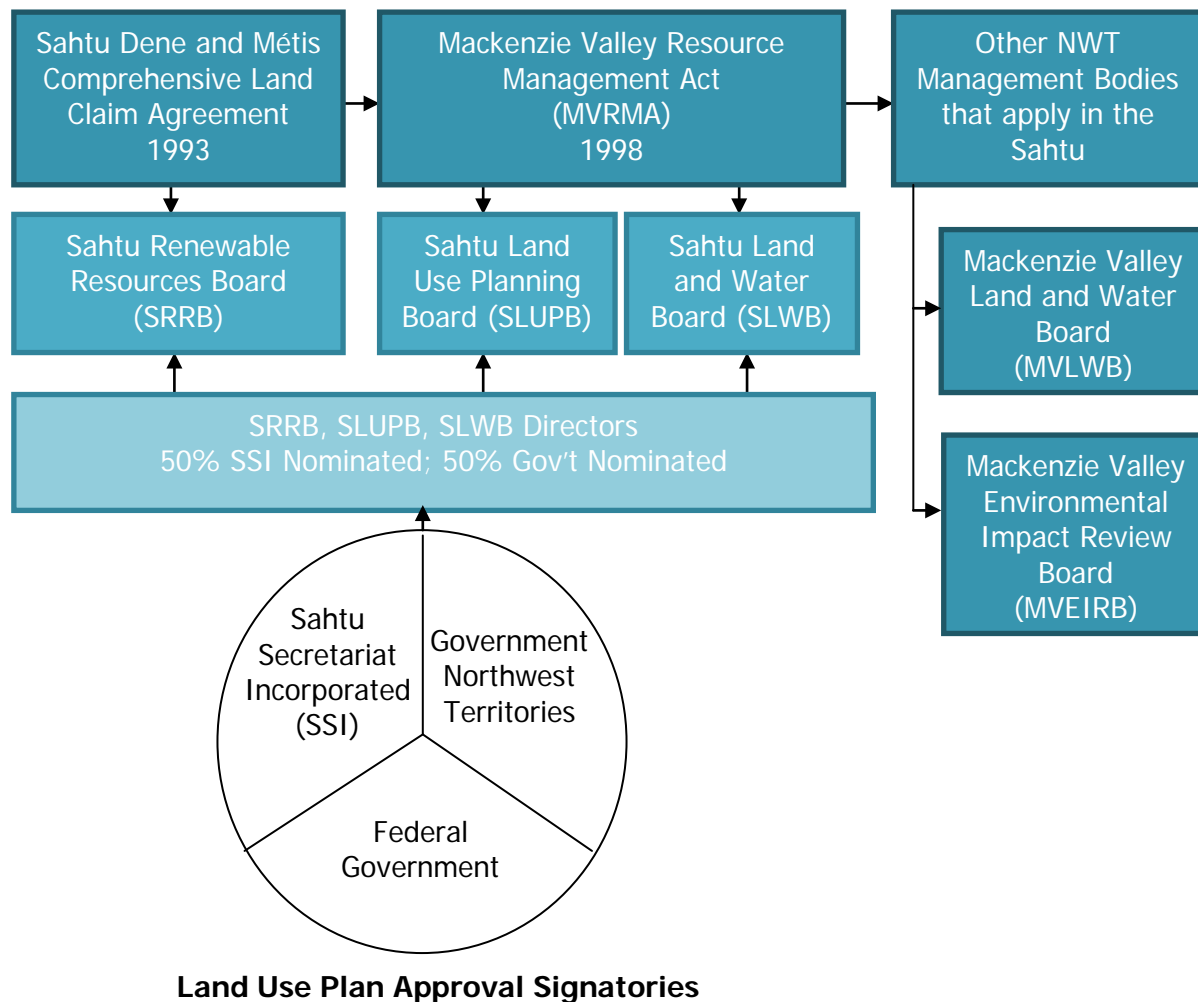
4.2 DESIGNATED SAHTU ORGANIZATIONS (DSOs)

The SDMCLCA establishes a number of Sahtu organizations known as Designated Sahtu Organizations to manage the funds, lands, rights and responsibilities of the Sahtu First Nation on behalf of all participants. These organizations (DSOs) are established as trusts, societies or corporations. The Sahtu Secretariat Incorporated (SSI) is the governing body, responsible for management of the funds and major programs while ownership and responsibility for Sahtu lands was given to the District Land Corporations as described earlier in this chapter. Sahtu municipal lands are held and administered either by the district land corporations, or the municipal land corporations where they exist (e.g. Tulita).

Land use activities carried out on Sahtu lands which require a land use permit, water licence or other authorization require proof of permission /agreement from the district land corporation to access their lands. The DSOs are referral organizations that provide comments relevant to their mandates for preliminary screening and environmental assessments.

For activities related to prospecting or staking a mineral claim on Sahtu lands, which do not require a land use permit, water licence or other authorization, the prospector is required to give 7 days' notice to the district land corporation before entering onto their lands. On lands where the district land corporation owns the mineral rights, companies wishing to access and explore for minerals or oil and gas must negotiate those rights directly with the district land corporation.

Figure 9. Regulatory Bodies in the SSA



Source: Oil and Gas Approvals in the Northwest Territories – Sahtu Settlement Area, February 2002, The Regulatory Roadmaps Project

4.3 CO-MANAGEMENT BOARDS IN THE SSA

The *Sahtu Dene and Métis Comprehensive Land Claim Agreement (SDMCLCA)* and the MVRMA introduced a new system of land and water management for the Sahtu Settlement Area (SSA). The system of cooperative management is aimed at ensuring the direct and meaningful participation of Sahtu residents in the management and regulation of the land, water and resources.

In contrast to the previous system that concentrated management authority with the federal and territorial governments, a co-management system recognizes the special knowledge Sahtu residents have about the land and gives them rights as land users.

Co-management boards are accountable to the public. Board members are nominated by the Aboriginal, territorial and federal governments. The people of the Sahtu are represented by the Sahtu Secretariat Incorporated (SSI) which nominates half of the members of each board. The

federal Minister appoints members to the board based on these nominations. Together, the four members of the board select a Chairperson.

4.3.1 Sahtu Land Use Planning Board (SLUPB)

Under Part 2 of the MVRMA, the Sahtu Land Use Planning Board (SLUPB) is responsible for preparing and adopting a land use plan for the Sahtu Settlement Area. The plan must be submitted to and approved by SSI, and the territorial and federal governments.

After the plan is approved, the Board is responsible for:

- monitoring the implementation of the Plan,
- considering applications for exceptions to the Plan,
- determining whether an activity is in accordance with the Plan when it is requested to do so, and
- preparing and adopting amendments to the Plan for approval by SSI and the territorial and federal governments.

The planning board will carry out a comprehensive review of the land use plan within five years of Plan approval and every five years after that or at other agreed upon intervals.

4.3.2 Sahtu Renewable Resources Board (SRRB)

The Sahtu Renewable Resources Board (SRRB) is the 'main instrument of wildlife and forest management' in the Sahtu Settlement Area. The SRRB works with the Sahtu Renewable Resource Councils (RRCs) to manage wildlife and forests. Their main responsibilities include wildlife management, wildlife research, conservation-education and consultations.

The SRRB:

- proposes and establishes policies to protect wildlife and wildlife habitat,
- develops wildlife management plans,
- reviews and approves proposed developments,
- oversees wildlife research in the SSA,
- provides students with opportunities to develop scientific learning and traditional skills,
- regularly consults with communities.

The SRRB was also responsible for conducting the Sahtu Harvest Study from 1998-2005. The SRRB is a referral organization providing comments relevant to its mandate for preliminary screenings and environmental assessments.

4.3.3 Renewable Resource Councils (RRC)

Under SDMCLCA Section 13.9, each community in the Sahtu Settlement Area has its own Renewable Resource Council, which is responsible for conservation, research and wildlife management on behalf of their community members as well as providing harvester assistance. The RRCs provide grassroots knowledge for their local area and have an advisory relationship with the Sahtu Renewable Resources Board.

The RRC is a referral organization providing comments relevant to its mandate for preliminary screenings and environmental assessments.

4.3.4 Sahtu Land and Water Board (SLWB)

The Sahtu Land and Water Board is a regional panel of the Mackenzie Valley Land and Water Board. It is the regulatory authority responsible for the management of land and water use and the deposit of waste in the Sahtu Settlement Area.

Under the Mackenzie Valley Resource Management Act, it issues, amends, and renews land use permits and water licences on government lands (crown land and Commissioner's Land), on Sahtu Settlement Lands, and on private lands. The Sahtu Land and Water Board is the lead preliminary screener in the SSA. The SLWB receives feedback on permits and licences from review organizations such as Designated Sahtu Organizations, community organizations, government departments and agencies and other co-management Boards.

4.3.5 Mackenzie Valley Land and Water Board (MVLWB)

The Mackenzie Valley Land and Water Board has three main functions:

- Issuing land use permits and water licenses in the unsettled claims area until the balance of the land claims are settled in the Mackenzie Valley;
- Processing transboundary land and water use applications in the Mackenzie Valley; and
- Ensuring consistency in the application of the legislation throughout the Mackenzie Valley.

For example, the Mackenzie Valley Land and Water Board would be the regulatory authority involved in a proposed land use activity that would affect both the Sahtu Settlement Area and the Gwich'in Settlement Area.

The Mackenzie Valley Land and Water Board consists of:

- The Gwich'in Land and Water Board (GLWB), the Sahtu Land and Water Board (SLWB), the Wek'eezhii Land and Water Board (WLWB);
- Four additional members (2 nominated by First Nations, 1 nominated by the GNWT, and 1 other); and
- A chairperson nominated by a majority of the members and appointed by the federal Minister.

4.3.6 Mackenzie Valley Environmental Impact Review Board (MVEIRB)

The Mackenzie Valley Environmental Impact Review Board (MVEIRB) is responsible for environmental assessment and public review of developments throughout the Mackenzie Valley. If a proposed development may have significant adverse environmental impacts or is of public concern it is referred to the Review Board for an environmental assessment.

In the Sahtu Settlement Area (SSA), a proposed development can be referred to the Review Board by:

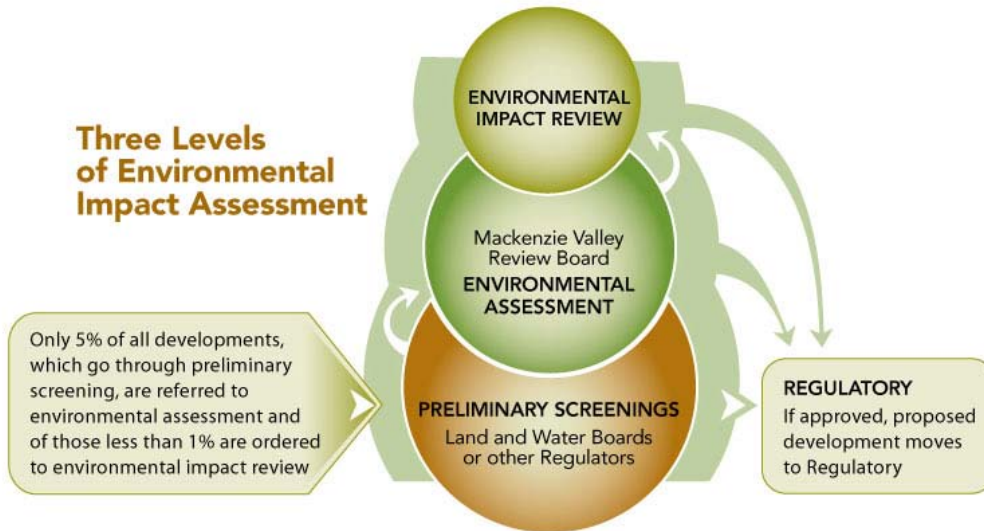
- a regulatory authority,
- a designated regulatory agency (the National Energy Board),
- a department or agency of the federal or territorial government,
- the Sahtu Secretariat Incorporated, or
- a local government if the development will occur or have an impact on the environment within its boundaries. The Review Board may also conduct an environmental assessment on its own motion.

Steps in the Regulatory Environment include:

- Preliminary Screening,
- Environmental Assessment and
- Environmental Impact Review.

They are nested within each other and go through the co-management boards listed above. See Figure 10 for an illustration of the co-management boards' place in the system.

Figure 10. Three Levels of Environmental Impact Assessment



Source: NWT Board Forum, Resource Management Information for the NWT website¹⁵⁸

¹⁵⁸ NWT Board Forum, Resource Management Information for the NWT: <http://nwtboardforum.com/process/regulatory-system-in-the-mackenzie-valley-region/>

4.4 GOVERNMENT OF THE NORTHWEST TERRITORIES (GNWT)

4.4.1 Environment and Natural Resources (ENR)

Environment and Natural Resources (ENR) is the GNWT Department responsible for promoting the wise use and protection of the NWT's natural resources. ENR's regional office in the Sahtu is in Norman Wells. ENR is responsible for administering the following Acts across the NWT:

- *Environmental Protection Act,*
- *Environmental Rights Act,*
- *Forest Management Act,*
- *Forest Protection Act,*
- *Natural Resources Conservation Trust Act,*
- *Pesticide Act,*
- *Waste Reduction and Recovery Act,*
- *Water Resources Agreements Act, and*
- *Wildlife Act.*

ENR is responsible for overseeing the protection of natural areas within the territories. It is the lead department in coordinating GNWT input into the land use plan and the Minister of ENR approves the Plan on behalf of the GNWT. It is one of many partners with INAC in the Protected Areas Strategy. For more information on partners visit:

<http://www.nwtpas.ca/partners-steeringcommittee.asp>.

ENR is involved in the regulatory review of land use permit and water licence applications, providing input related to the management of wildlife, forests, air and water. ENR is a referral organization providing comments relevant to its mandate for preliminary screenings and environmental assessments. It is also responsible for issuing authorizations related to wildlife and forestry use and responsible for wildlife research and issuance of Wildlife Research Permits. It is also responsible for documenting resident and non-resident wildlife harvests.

4.4.2 Industry, Tourism and Investment (ITI)

The Department of Industry, Tourism and Investment (ITI), was established in April 2005 to promote economic self-sufficiency in the NWT by promoting natural resource development in industries and supporting tourism, trade and investment, and business. ITI works in partnership with businesses and others to promote and support the economic development opportunities across the Northwest Territories and within its communities.

ITI manages 6 program divisions grouped under two directional priorities:

- Economic Development
 - Tourism and Parks, and
 - Investment and Economic Analysis
- Energy, Mines, and Petroleum Resources
 - Mackenzie Valley Pipeline,
 - Minerals, Oil and Gas,

- Energy Planning,
- Industrial Initiatives.

ITI administers a number of Acts and Regulations governing economic development and tourism within the Sahtu, namely the *Northwest Territories Business Development and Investment Corporation Act, Territorial Parks Act, Freshwater Fish Marketing Act, and Tourism Act*.

ITI is involved in the regulatory review of land use permit and water licence applications, providing input related to minerals and oil and gas development, energy development, and tourism. ITI is a referral organization providing comments relevant to its mandate for preliminary screenings and environmental assessments. It is also responsible for issuing authorizations related to tourism including Tourism Operator Licences. All businesses that offer "guided commercial tourism activities" need such a licence.

4.4.3 Department of Transportation (DOT)

The mandate of the Department of Transportation, Government of the Northwest Territories is to plan, design, construct or reconstruct, acquire, operate and maintain public transportation infrastructure in the NWT, including community airports, docks and the highway system, and to regulate and license individuals and vehicles operating in the territory.

The Department is responsible for a transportation system that consists of 2,200 kilometres of all-weather highway, 1,450 kilometres of publicly constructed winter roads, five ferry and ice crossings and 27 community airports.

The Department of Transportation administers and is governed by the following NWT legislation (and their associated Acts):

- *All-Terrain Vehicles Act*
- *Deh Cho Bridge Act*
- *Motor Vehicles Act*
- *Public Airports Act*
- *Public Highways Act*
- *Transportation of Dangerous Goods Act*

It may be involved in the regulatory review of land use permit and water licence applications, providing input related to transportation. DOT is a referral organization providing comments relevant to its mandate for preliminary screenings and environmental assessments. Often, it is an applicant in the regulatory process, as it requires land use permits and water licences to construct winter roads and transportation infrastructure.

4.4.4 Municipal and Community Affairs (MACA)

MACA contributes funding to communities to assist them in providing services to their residents. MACA's key function relevant to this plan is community land administration. MACA administers Commissioner's Lands, provides advice and assistance to community governments on land use

and community planning, performs property assessments, and provides technical mapping and surveying services to community governments and the public. Its mission is to work with community governments and other partners in supporting community residents as they organize and manage democratic, responsible and accountable community governments. MACA is responsible for administering the *Planning Act*, *the Hamlets Act*, *the Charter Communities Act*, *and the Cities, Towns and Villages Act*, *Commissioner's Land Act* and *Property Assessment and Taxation Act*, among many others.

MACA is a referral organization providing comments relevant to its mandate for preliminary screenings and environmental assessments. It is involved in the regulatory review of land use permit and water licence applications for land use activities within community boundaries, or affecting community interests (e.g. where an applicant proposes to use community infrastructure or resources). It is responsible for authorizing land uses on Commissioner's Lands. Approximately 84% of NWT land is federal Crown Land. The majority of the remaining 16% of land is privately held by the Land Claimant Corporations in settled land claim areas.

4.5 GOVERNMENT OF CANADA

4.5.1 Indian and Northern Affairs Canada (INAC)

INAC is the lead federal department for two-fifths of Canada's land mass, with a direct role in the political and economic development of the territories, and significant responsibilities for resource, land and environmental management.

"Indian and Northern Affairs Canada (INAC) supports Aboriginal people (First Nations, Inuit and Métis) and Northerners in their efforts to:

- improve social well-being and economic prosperity;
- develop healthier, more sustainable communities; and,
- participate more fully in Canada's political, social and economic development- to the benefit of all Canadians.

INAC is one of the Government departments responsible for meeting Canada's obligations and commitments to First Nations, Inuit and Métis and for fulfilling the federal government's constitutional responsibilities in the North. INAC's responsibilities are largely determined by numerous statutes, negotiated agreements and relevant legal decisions."¹⁵⁹

Approximately 97% of land in the Northwest Territories is Crown land. INAC is the federal department responsible for administering and managing land, water and resources on Crown lands in the Northwest Territories. It administers or has responsibilities under several pieces of legislation, including:

- *The Territorial Lands Act and Territorial Lands Act and Regulations;*
- *The Canada Petroleum Resources Act*
- *The Canada Oil and Gas Operations Act*
- *The Mackenzie Valley Resource Management Act*
- *The NWT Waters Act*

¹⁵⁹ Indian and Northern Affairs Canada: <http://www.ainc-inac.gc.ca/ai/index-eng.asp>

- *The Department of Indian Affairs and Northern Development Act*

Some of its core programs and responsibilities related to planning include:

- Partnering with the GNWT, Aboriginal organizations, environmental non-governmental organizations, and industry representatives on the Protected Areas Strategy;
- Coordinating federal input on land use planning and approving the Plan;
- Management and cleanup of contaminated sites;
- Develop mineral and oil and gas potential.

Within the regulatory process, INAC is responsible for disposing of rights to subsurface resources, collecting royalties, authorizing access to Crown lands (surface leases), providing comments in regulatory reviews on matters related to its jurisdiction, responding on behalf of all Responsible Ministers to recommendations made by the Mackenzie Valley Environmental Impact Review Board, and inspecting and enforcing conditions of permits and licences. It is also a referral organization providing comments relevant to its mandate for preliminary screening and environmental assessments. In short, INAC holds a significant amount of authority over the use of land, waters and resources within the Sahtu Settlement Area.

4.5.2 Department of Fisheries and Oceans Canada (DFO)

“DFO is responsible for developing and implementing policies and programs in support of Canada’s scientific, ecological, social and economic interests in oceans and fresh waters.

DFO is a national and international leader in marine safety and in the management of oceans and freshwater resources. Departmental activities and presence on Canadian waters help to ensure the safe movement of people and goods. As a sustainable development department, DFO will integrate environment, economic and social perspectives to ensure Canada’s oceans and freshwater resources benefit this generation and those to come.

The Department’s guiding legislation includes the Oceans Act, which charges the Minister with leading oceans management and providing coast guard and hydrographic services on behalf of the Government of Canada, and the Fisheries Act, which confers responsibility to the Minister for the management of fisheries, habitat and aquaculture. The Department is also one of the three responsible authorities under the Species at Risk Act.”¹⁶⁰

Fisheries and Ocean Canada is primarily responsible for managing fish and fish habitat. It administers the *Fisheries Act* and associated regulations and has responsibilities under the *Species at Risk Act* for aquatic species, including fish and aquatic plants. DFO is responsible for issuing authorizations for activities that will cause the harmful alteration, disruption or destruction of fish habitat. It is a referral organization providing comments relevant to its mandate for preliminary screening and environmental assessments. DFO participates in project reviews and provides comments related to fish, fish habitat, marine mammals and aquatic plants.

¹⁶⁰ Fisheries and Oceans Canada: <http://www.dfo-mpo.gc.ca/us-nous/vision-eng.htm>

4.5.3 Environment Canada (EC), Canadian Wildlife Service (CWS) and Parks Canada (PC)

Environment Canada's mandate is to:¹⁶¹

- Preserve and enhance the quality of the natural environment, including water, air, soil, flora and fauna;
- conserve Canada's renewable resources;
- conserve and protect Canada's water resources;
- forecast weather and environmental change;
- enforce rules relating to boundary waters;
- and coordinate environmental policies and programs for the federal government.

Environment Canada implements a number of statutes. Some of its key statutes are the:

- Pollution Prevention Provisions of the *Fisheries Act*;
- *Canadian Environmental Protection Act*;
- *Migratory Birds Convention Act, 1994*;
- *Canada Wildlife Act*;
- *The Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act*; and
- *Species at Risk Act*.

The Canadian Wildlife Service is Canada's national wildlife agency. It handles wildlife matters that are the responsibility of the federal government, including the protection and management of migratory birds and nationally important wildlife habitat, endangered species, research on nationally important wildlife issues, control of international trade in endangered species, and international treaties. It is serving, or has been requested to serve, as the sponsoring agency for several areas in the Sahtu Settlement Area to establish as National Wildlife Areas through the NWT Protected Areas Strategy.

"On behalf of the people of Canada, Parks Canada protects and presents nationally significant examples of Canada's natural and cultural heritage and fosters public understanding, appreciation and enjoyment in ways that ensure their ecological and commemorative integrity for present and future generations."¹⁶²

Parks Canada manages national parks, national marine conservation areas and national historic sites on behalf of Canadians. It is a separate Government of Canada Agency that derives its mandate from several pieces of legislation:

- the *Parks Canada Agency Act*;
- the *Canada National Parks Act*;
- the *Canada National Marine Conservation Areas Act*;
- the *Historic Sites and Monuments Act*; and
- the *Species at Risk Act*.

¹⁶¹ Environment Canada: <http://www.ec.gc.ca/default.asp?lang=En&n=BD3CE17D-1>

¹⁶² Parks Canada: http://www.pc.gc.ca/agen/index_e.asp

Environment Canada, the Canadian Wildlife Service and Parks Canada are all involved in regulatory reviews of projects and provide comments relating to areas within their respective mandates. Environment Canada and the Canadian Wildlife Service are both referral organizations providing comments relevant to their mandate for preliminary screenings and environmental assessments.

4.5.4 Transport Canada (TC)

"Transport Canada is responsible for transportation policies and programs. It ensures that air, marine, road and rail transportation are safe, secure, efficient and environmentally responsible."¹⁶³

TC's mission is to "serve the public interest through the promotion of a safe and secure, efficient and environmentally responsible transportation system in Canada."¹⁶⁴ Transport Canada has the responsibility and authority to propose and enforce laws and regulations to ensure safe, secure, efficient and clean transportation. The following are only a few key pieces of legislation that Transport Canada has authority for:

- *Bridges Act;*
- *Canada Shipping Act;*
- *Canada Transportation Act;*
- *Motor Vehicle Safety Act;*
- *Motor Vehicle Transport Act;*
- *Navigable Waters Protection Act;*
- *Public Safety Act; and*
- *Transportation of Dangerous Goods Act.*

TC is a referral organization providing comments relevant to its mandate for preliminary screenings and environmental assessments.

4.5.5 Canadian Nuclear Safety Commission (CNSC)

"The Canadian Nuclear Safety Commission regulates the use of nuclear energy and materials to protect the health, safety and security of Canadians and the environment; and to respect Canada's international commitments on the peaceful use of nuclear energy.

Under the Nuclear Safety and Control Act, CNSC's mandate involves four major areas:

- regulation of the development, production and use of nuclear energy in Canada to protect health, safety and the environment
- regulation of the production, possession, use and transport of nuclear substances, and the production, possession and use of prescribed equipment and prescribed information

¹⁶³ Transport Canada: <http://www.tc.gc.ca/eng/aboutus-menu.htm>

¹⁶⁴ Transport Canada: <http://www.tc.gc.ca/eng/aboutus-department-overview.htm>

- implementation of measures respecting international control of the development, production, transport and use of nuclear energy and substances, including measures respecting the non-proliferation of nuclear weapons and nuclear explosive devices
- dissemination of scientific, technical and regulatory information concerning the activities of CNSC, and the effects on the environment, on the health and safety of persons, of the development, production, possession, transport and use of nuclear substances.”¹⁶⁵

Organizations applying for licences are subject to rules and regulations that make nuclear energy and materials safe. The CNSC administers these regulations, including the *Nuclear Safety and Control Act and Regulations*, and *Nuclear Liability Act*. The CNSC however, does not regulate exploration for uranium until advanced stages of exploration, specifically underground development.

The CNSC implements Canada's bilateral agreement with the International Atomic Energy Agency on nuclear safeguards verification and conducts environmental assessments on projects related to nuclear energy under the *Canadian Environmental Assessment Act*.

4.5.6 National Energy Board (NEB)

“The National Energy Board (the NEB or the Board) is an independent federal regulatory agency that was established in 1959. The Board regulates the following specific aspects of the energy industry:

- the construction and operation of interprovincial and international pipelines;
- pipeline traffic, tolls and tariffs;
- the construction and operation of international and designated interprovincial power lines;
- the export and import of natural gas;
- the export of oil and electricity; and
- Frontier oil and gas activities.

Other responsibilities include:

- providing energy advice to the Minister of Natural Resources in areas where the Board has expertise derived from its regulatory functions;
- carrying out studies and preparing reports when requested by the Minister;
- conducting studies into specific energy matters;
- holding public inquiries when appropriate; and
- monitoring current and future supplies of Canada's major energy commodities.

In addition to its responsibilities under the National Energy Board Act (NEB Act), the Board also has responsibilities under the Canada Oil and Gas Operations Act, the Canadian Environmental Assessment Act, the Northern Pipeline Act, and certain Provisions of the Canada Petroleum Resources Act. As a result of the Canada Transportation Act, which came into effect on

¹⁶⁵ Canadian Nuclear Safety Commission: <http://www.cnsccsn.gc.ca/eng/about/mission/index.cfm>

1 July 1996, the Board's jurisdiction has been broadened to also include pipelines that transport commodities other than oil or natural gas.

The Board's corporate purpose is to regulate pipelines, energy development and trade in the Canadian public interest."¹⁶⁶

Interprovincial and international oil and gas pipelines and additions to existing pipeline systems under federal jurisdiction require the NEB's approval before they may be built. The NEB authorizes the construction and operation of international power lines and designated interprovincial lines under federal jurisdiction. The NEB is responsible for ensuring environmental protection during the planning, construction, operation and closure of energy projects within its jurisdiction and ensuring companies comply with regulations concerning the safety of employees, the public, and the environment, as they may be affected by the design, construction, operation, maintenance and closure of a pipeline.

The NEB administers or has responsibilities relating to the following key acts and associated regulations:

- *National Energy Board Act;*
- *Canada Oil and Gas Operations Act;*
- *Canada Petroleum Resources Act;*
- *Canada Environmental Protection Act;*
- *Canada Environmental Assessment Act;*
- *Mackenzie Valley Resource Management Act; and*
- *Species at Risk Act.*

The NEB is a referral organization providing comments relevant to its mandate for preliminary screenings and environmental assessments.

4.5.7 Natural Resources Canada (NRCan)

"Natural Resources Canada (NRCan) seeks to enhance the responsible development and use of Canada's natural resources and the competitiveness of Canada's natural resources products."¹⁶⁷ The Department is a leader in science and technology in the fields of energy, forests, and minerals and metals. It builds and maintains an up-to-date knowledge base of Canada's landmass and develops policies and programs that enhance the contribution of the natural resources sector to the economy. NRCan issues authorizations for blasting.

¹⁶⁶ National Energy Board: <http://www.neb-one.gc.ca/clf-nsi/rthnb/whwrndrgvrnnc/rhstry-eng.html>

¹⁶⁷ Natural Resources Canada: <http://www.nrcan-rncan.gc.ca/com/deptmini/index-eng.php>

Appendix 1. Level III Ecoregions

Table 21. Level III Taiga Plains Ecoregions in the Sahtu

Distinguishing characteristic	Level III Taiga Plains Ecoregions	
	Taiga Plains High Subarctic (HS)	Taiga Plains Low Subarctic (LS)
Temperature regime	<ul style="list-style-type: none"> ▪ Very short, cool summers ▪ Frost common except in July and Aug ▪ Very cold winters ▪ Mean annual temperatures -8.5°C to -13°C 	<ul style="list-style-type: none"> ▪ Short, cool summers ▪ Very cold winters ▪ Mean annual temperature -4.5°C to -8.5°C
Average annual precipitation	250-320 mm most falls in late summer, early fall	230-350 mm most falls in late summer, early fall
Relative insolation	<9 mJ/m ² /day	9-9.5 mJ/m ² /day
Characteristic permafrost features, peatlands, and soils	<p>Widespread and continuous permafrost</p> <ul style="list-style-type: none"> ▪ Polygonal peat plateaus are the most common permafrost form ▪ Earth hummocks are widespread and evident in open areas ▪ Thermokarst is not common ▪ Permafrost depth is 30 cm ▪ Polygonal peat plateaus are the common wetland type ▪ Cryosols are the dominant soils with some Brunisols on coarse-textured materials 	<p>Widespread permafrost</p> <ul style="list-style-type: none"> ▪ "Runnel" permafrost forms are common on slopes with permafrost within 30 cm of the organic surface under lichen cover and Gleysols in the shrubby channels between the spruce-lichen uplands. ▪ Polygonal peat plateaus locally common in the Keller Plain area ▪ Large areas of peat plateaus and some polygonal peat plateaus ▪ Widespread occurrence of earth hummocks ▪ Soils are dominantly Cryosols and on coarse-textured materials, Brunisols
Characteristic forest cover	<ul style="list-style-type: none"> ▪ Very open stunted forests of black and white spruce with lichen understory ▪ White spruce occurs near the limit of tree growth as stunted individuals along creeks and on well-drained materials 	<ul style="list-style-type: none"> ▪ Open canopy white and black spruce forests with lichen and low shrub understory ▪ Tree growth tends to be better by streams
Trembling aspen and jack pine occurrence	<ul style="list-style-type: none"> ▪ Trembling aspen is rare, found only on south slopes, will be stunted ▪ Jack pine is absent 	<ul style="list-style-type: none"> ▪ Trembling aspen is restricted to warm aspects or well-drained sites and often stunted ▪ Alaska paper birch is a more common deciduous species ▪ Jack pine is rare

Source: Reproduced in part from Ecological Regions of the Northwest Territories – Taiga Plains report, P.8

Table 22. Level III Cordillera Ecoregions in the Sahtu

Distinguishing characteristic	Level III Cordillera Ecoregions			
	Tundra Cordillera and Taiga Cordillera High Subarctic (HS)	Taiga Cordillera Low Subarctic (LS)	Boreal Cordillera High Boreal (HB)	Boreal Cordillera Mid-Boreal (MB)
Temperature regime	<ul style="list-style-type: none"> ▪ Very short, cold summers ▪ Frost probably occurs every month ▪ Extremely cold and long winters ▪ Mean annual temperature -9°C to -10°C 	<ul style="list-style-type: none"> ▪ Short, cool summers ▪ Very cold winters ▪ Mean annual temperature -4°C to -8°C 	<ul style="list-style-type: none"> ▪ Short, cool summers ▪ Very cold winters ▪ Mean annual temperature -4°C to -5°C 	<ul style="list-style-type: none"> ▪ Short, wet summers ▪ Very cold and snowy winters ▪ Mean annual temperature -4°C to -6°C
Average annual precipitation	<ul style="list-style-type: none"> ▪ 210-290 mm ▪ 60-70% of precipitation falls from May-September 	<ul style="list-style-type: none"> ▪ 280-350 mm ▪ 60-70% of precipitation falls from May-September 	<ul style="list-style-type: none"> ▪ 340-400 mm ▪ 60-70% of precipitation falls from May-September 	<ul style="list-style-type: none"> ▪ 400-600 mm ▪ about 50% as rain or snow May-September ▪ 50% as snow October-April
Relative insolation	9-9.5 mJ/m ² /day	9.5-10.5 mJ/m ² /day	10-10.5 mJ/m ² /day	9.5-10 mJ/m ² /day
Characteristic permafrost features, peatlands, and soils	<p>Continuous permafrost</p> <ul style="list-style-type: none"> ▪ Patterned ground, nonsorted circles and runnels - most common permafrost forms, mainly found in larger valleys ▪ Polygonal peat plateaus occur on subdued terrain at lower elevations, rare in mountain valleys ▪ Permafrost depth: 30 cm in 	<p>Continuous to discontinuous permafrost</p> <ul style="list-style-type: none"> ▪ Peat plateaus, runnels and veneer bogs common at lower elevations and on gentle to moderate terrain in plains and foothills N and E of mountains ▪ Polygonal peat plateaus occur on similar terrain mostly N of Keele River 	<p>Continuous to discontinuous permafrost</p> <ul style="list-style-type: none"> ▪ Peat plateaus, runnels and veneer bogs uncommon, occur mainly along border with Low Subarctic ▪ Solifluction common on mountain slopes with fine-textured materials ▪ Alpine areas: Cryosols and Brunisols, Regosols or 	<p>Continuous to discontinuous permafrost</p> <ul style="list-style-type: none"> ▪ Glaciers and icefields at high elevations ▪ Solifluction on some slopes indicates presence of permafrost at depth

	<p>subalpine areas</p> <ul style="list-style-type: none"> ▪ Dominant soils: Cryosols Brunisols on coarse-textured materials; Regosols or non-soils (bedrock) in alpine areas 		non-soils (bedrock)	
Characteristic forest cover	<ul style="list-style-type: none"> ▪ Open, usually stunted spruce woodlands dominant in subalpine ▪ At northern boundary with Low Arctic defined by tree line, trees occur in small stands only along lakeshores, lower slopes, eskers and gullies ▪ At boundary between subalpine and alpine areas, trees grow sparsely on southerly slopes ▪ No Jack pine or trembling aspen 	<ul style="list-style-type: none"> ▪ Open spruce woodlands with lichen and shrub understories dominant in subalpine ▪ Aspen occur mainly in southeastern part on low-elevation terrain and on south-facing low elevation valley slopes to the north ▪ Jack pine occurs mainly in Mackenzie Valley 	<ul style="list-style-type: none"> ▪ Lodgepole Pine is characteristic ▪ Alpine fir occur in scattered stands at higher elevations near tree line ▪ Dense vigorous aspen, mixed-wood and spruce forests and sedge-dominated wetlands common on lower valley slopes and valley floors 	<ul style="list-style-type: none"> ▪ Alpine fir and plant species occur ▪

Table 23. Level III Taiga Shield Ecoregions in the Sahtu

Distinguishing characteristic	Level III Taiga Shield Ecoregions	
	Taiga Shield High Subarctic (HS)	Taiga Shield Low Subarctic (LS)
Temperature regime	<ul style="list-style-type: none"> ▪ Very short, cool summers ▪ Frost common except in July and August ▪ Very cold winters ▪ Mean annual temperatures -4°C to -9°C 	<ul style="list-style-type: none"> ▪ Short, cool summers ▪ Very cold winters ▪ Mean annual temperature -3.5°C to -9°C
Average annual precipitation	270-390 mm summer-high precipitation pattern	230-430 mm summer-high precipitation pattern
Relative insolation	<10-11 mJ/m ² /day	10-11 mJ/m ² /day
Characteristic permafrost features, peatlands, and soils	<p>Widespread permafrost, continuous near boundary with Level III Southern Arctic Ecoregion</p> <ul style="list-style-type: none"> ▪ Patterned ground and nonsorted circles are most common permafrost forms with polygonal peat plateaus in wet depressions ▪ Limited shore fens and floating fens ▪ 30 cm permafrost depth ▪ Cryosols are dominant soils with Brunisols on coarse-textured materials 	<p>Widespread permafrost</p> <ul style="list-style-type: none"> ▪ Organic landforms limited ▪ Peat plateaus most common permafrost-affected peatland type ▪ Shore fens and floating fens occur ▪ Soils are Brunisols in mineral soil or Organic and Organic Cryosolic soils in peatlands
Characteristic forest cover	<ul style="list-style-type: none"> ▪ Open, usually stunted black and white spruce woodlands ▪ At northern boundary with the Southern Arctic, defined by the treeline, trees occur in small stands only along lakeshores, lower slopes, eskers and gullies ▪ No Jack pine or trembling aspen 	<ul style="list-style-type: none"> ▪ Mostly open, low-growing black spruce forests with lichen and shrub understories ▪ Fewer Jack pine stands than in mid- or high-Boreal ecoregions
Other distinguishing features	<ul style="list-style-type: none"> ▪ Lichen-dominated till plains are characteristic of the north-east area 	<ul style="list-style-type: none"> ▪ At the boundary with High Subarctic, hilltops and islands in lakes are treeless and have shrub tundra communities

Source: reproduced in part from Ecological Regions of the Northwest Territories – Taiga Shield report, P.8