KEEYASK TRANSMISSION PROJECT

SOCIO-ECONOMIC TECHNICAL REPORT

Prepared for: Manitoba Hydro
Transmission Licensing and Environmental
Assessment Department

Submitted by:

September 2012

PREFACE

The following is one of several technical reports for Manitoba Hydro's application for environmental licensing of the Keeyask Transmission Project. This technical report has been prepared by an independent technical discipline specialist who is a member of the Environmental Assessment Study Team retained to assist in the environmental assessment of the Project. This report provides detailed information and analyses on the related area of study. The key findings outlined in this technical report are integrated into the Keeyask Transmission Environmental Assessment Report.

Each technical report focuses on a particular biophysical or socio-economic subject area and does not attempt to incorporate information or perspectives from other subject areas with the exception of Aboriginal Traditional Knowledge (ATK). Applicable ATK is incorporated where available at time of submission. Most potentially significant issues identified in the various technical reports are generally avoided through the Site Selection and Environmental Assessment (SSEA) process. Any potentially significant effects not avoided in this process are identified in the Environmental Assessment Report along with various mitigation options that would address those potential effects.

While the format of the technical reports varies between each discipline, the reports generally contain the following:

- Methods and procedures.
- Study Area characterization.
- Description and evaluation of alternative routes and infrastructure sites.
- Review of potential effects associated with the preferred transmission routes and station sites.

Following receipt of the required environmental approvals, an Environmental Protection Plan (EnvPP) will be completed and will outline specific mitigation measures to be applied during construction, operation and maintenance of the proposed Keeyask Transmission Project. An EnvPP is typically developed from a balance of each specialist's recommendations and external input.

Each of the technical reports is based on fieldwork and analysis undertaken throughout the various stages of the SSEA process for the Project. The technical reports are as follows:

- Technical Report 1: Aquatics Environment
- Technical Report 2: Terrestrial Habitat, Ecosystems and Plants
- Technical Report 3: Amphibians
- Technical Report 4: Avian

- Technical Report 5: Mammals
- Technical Report 6: Forestry
- Technical Report 7: Socio-economic Environment
- Technical Report 8: Heritage Resources
- Technical Report 9: Tataskweyak Cree Nation Report on Keeyask Transmission Project

The technical reports contain more detail on individual subject areas than is provided in the Environmental Assessment Report. The technical reports have been reviewed by Manitoba Hydro, but the content reflects the opinions of the author. They have not been edited for consistency in format, style and wording with either the Environmental Assessment Report or other technical reports.

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EXECUTIVE SUMMARY

This report summarizes the socio-economic environmental assessment conducted for the Keeyask Transmission project. The Keeyask Transmission Project consists of the Construction Power line and Construction Power Station; four Unit lines that originate at the Keeyask Generation Station and terminate at a new Keeyask Switching Station; the Keeyask Switching Station; three Generation Outlet Transmission (GOT) lines link the Keeyask Switching Station to the northern collector system, terminating at the Radisson Converter Station; and Radisson Converter Station Upgrades.

Sources of information used during the assessment included information researched for and compiled in the Socio-economic Environment Supporting Volume to the Keeyask Generation Project Environmental Impact Statement (Keeyask Hydropower Limited Partnership 2012). Aboriginal traditional knowledge (ATK) was provided in an evaluation report prepared by TCN and through workshops held in 2012 with FLCN. In addition, Manitoba Hydro is currently undertaking ATK studies with the Manitoba Metis Federation (MMF) and FLCN related to the project. Other sources of information relied on in this technical report include government publications and datasets.

Four valued environmental components (VECs) of the socio-economic environment were identified: land and resource use; economy; population, infrastructure and services and personal, family and community life. Alternative sites and routes for Project infrastructure were reviewed from the perspective of potential effects on these socio-economic VECs. Preferred socio-economic route and site alternatives were included in the overall site selection process leading to the preferred routes and sites for Project infrastructure as described in Chapter 6 of the Environmental Assessment Report.

The assessment of potential environmental effects of the Project on socio-economic VECs was undertaken consistent with the assessment approach for the Project described in Chapter 3 of the Environmental Assessment Report. Residual effects, following mitigation, were reviewed and characterized. Residual effects on socio-economic VECs are expected to include:

- **Land and Resource Use:**
    - □ Effects to domestic resource use during the construction and operations phases;
    - □ Creation of access for recreational hunters and other recreational resource users during the construction and operations phases;
    - □ Effects on commercial trapping during the construction and operations phases; and

- □ Disturbance of access to some trails and travel routes currently used for recreation during the construction phase of the project.

- **Economy:**

  - □ Increased direct employment and contracting opportunities during construction and operations; and

  - □ Increased demands for supplies and services during the construction phase.

- **Population, Infrastructure and Services:**

  - □ Increased traffic in the vicinity of Gillam and on PR 280 between Gillam and Thompson during the construction phase;

  - □ Increased demands on community health and emergency services during the construction phase; and

  - □ Increased demands on recreation and leisure services during the construction phase.

- **Personal, Family and Community Life:**

  - □ Possibility of workplace health effects during the construction phase;

  - □ Possibility of accidents or injuries to area residents or resource users at the construction site during the construction phase;

  - □ Effects to human health from electro-magnetic fields during the operations phase;

  - □ Risks to public safety related to an influx of non-local construction workers during the construction phase;

  - □ Loss of cultural landscape and culturally important resource use opportunities during construction and operations; and

  - □ Physical changes to the landscape and aesthetics during construction and operations.

Monitoring is recommended to ensure residual project effects do not exceed the scale, duration and geographic extent described in this report and to ensure any unanticipated effects of the Project can be identified and mitigated if necessary.

1.0 INTRODUCTION

1.1 OVERVIEW

This socio-economic technical report **Environmental Assessment** (EA) has been developed for Manitoba Hydro's proposed Keeyask Transmission Project (the Project). The Project is designed to support the proposed Keeyask Generation Project development at Gull Rapids on the Nelson River.

The Keeyask Transmission Project is located within a triangular shaped geographic area that encompasses Gull Rapids and the major components of the proposed Keeyask Generation Project. The Project Study Area (PSA) extends along the southern shore of Stephens Lake to Kettle Generating Station and the Radisson Converter Station. The southern boundary of the PSA runs northeast to southwest paralleling the existing KN36 and R26K **transmission lines** to a point east of little Kettle Lake where the western boundary extends north-northwest to Gull Lake (Map 1-1).

This socio-economic technical report describes the environmental assessment conducted on aspects of the socio-economic environment including land and resource use, the economy, population, infrastructure and services and personal, family and community life. The Project will directly affect the socio-economic environment during both the construction and operation phases of the development as a result of clearing requirements and employment and business opportunities related to the Project.

The socio-economic analysis focuses primarily on three communities:

- Split Lake which is the reserve community for Tataskweyak Cree Nation (TCN) (formerly known as Split Lake Cree Nation). The Project would be constructed in the Split Lake Resource Management Area (SLRMA) where TCN Members engage in resource harvesting activities.

- Fox Lake (Bird) is one of the reserve communities for Fox Lake Cree Nation (FLCN). Many FLCN Members live in Gillam and on the A Kwis Ki Mahka reserve and engage in resource harvesting activities in the Project Study Area.

- Gillam, which is the primary service centre for the area.

Collectively, these communities and the PSA are referred to as the Socio-economic Project Study Area (SPSA). Throughout the document different terms are used related to these communities:

- Tataskweyak Cree Nation (TCN): Refers to the First Nation that has Members living on-reserve in Split Lake, as well as off-reserve in Thompson, Winnipeg and other locations. TCN is also used to refer to the First Nation's leadership and services provided by the First Nation.

- Split Lake: Refers to the Census community Split Lake 171. Split Lake is populated primarily by TCN Members living on-reserve, although some non-TCN Members may also reside in Split Lake.

- Fox Lake Cree Nation (FLCN): Refers to the First Nation that has Members living on-reserve in Fox Lake (Bird), on the A Kwis Ki Mahka Reserve near Gillam and off-reserve in Gillam, Thompson, Winnipeg and other locations. FLCN is also used to refer to the First Nation's leadership and services provided by the First Nation.

- Fox Lake (Bird): Refers to the Census community Fox Lake 2 located at Bird. Fox Lake (Bird) is populated primarily by FLCN Members living on-reserve, although some non-FLCN Members may also reside in Fox Lake (Bird).

In some instances information is provided for the City of Thompson, the nearest regional centre to the Project. Information for Northern Manitoba and Manitoba is provided at times for comparison purposes.

1.2 PROJECT COMPONENT OVERVIEW

The Keeyask Transmission Project will consist of the following components:

- Construction Power line and Construction Power Station;

- Four Unit lines that originate at the Keeyask Generation Station and terminate at a new Keeyask Switching Station;

- Keeyask Switching Station;

- Three Generation Outlet Transmission (GOT) lines link the Keeyask Switching Station to the northern collector system, terminating at the Radisson Converter Station; and

- Radisson Converter Station Upgrades.

1.2.1 Construction Power Line and Station

A new construction power transmission line (138 kV and approximately 22 km long) from the existing 138 kV KN36 transmission line to a new 138 kV to 12.47 kV Construction Power Station to be located north of the proposed Keeyask Generation Station.

The purpose of the Construction Power line and Station is to provide power for the construction activities of the Keeyask Generation Station. After operation, the Construction Power transmission line will be left in place, as will a portion of the Construction Power Station, to provide a contingency function for a “black start” emergency backup to diesel generation units at the Keeyask Generation Station.

1.2.2 Unit Transmission Lines

Four 138 kV ac Unit Transmission lines (KE1 to 4) will transmit power from the seven generators located at the Keeyask Generation Station to the new Keeyask Switching Station. Three lines will be double circuit and one line single circuit to accept power from the seven Generation Station turbines. The four lines, each approximately 4 km long, will be located in a single corridor.

1.2.3 Keeyask Switching Station

A new Keeyask Switching Station will accept power from the Keeyask Generation Station via four Unit transmission lines from the Generation Station transformers and transfer that power to three Generation Outlet Transmission lines. The Keeyask Switching Station will be located on the south side of the Nelson River. The purpose of the Keeyask Switching Station is to provide the terminal facilities for the electrical connection to the Generation Station, and to provide flexibility for accommodating power transmission from the Generation Station to the Radisson Converter Station.

1.2.4 Generation Outlet Transmission Lines

Three 138 kV ac Generation Outlet Transmission lines will transmit power from the Keeyask Switching Station to the existing Radisson Converter Station 138 kV ac switchyard. The three lines, each approximately 38 km long, will be located along a single route. Manitoba Hydro plans to build one of these GOT lines to serve as a backup construction power line during construction and the line will be partially salvaged back to the Keeyask Switching Station and utilized as a generation outlet transmission line.

1.2.5 Radisson Converter Station Upgrades

The existing Radisson Converter Station will be upgraded in two stages, as follows:

1. Stage I: Radisson Converter Station will require the addition of a 138 kV breaker to accommodate the initial new 138 kV transmission line KR1 from the Keeyask Switching Station.

2. Stage II: Station equipment will include the addition of a 138 kV bay (Bay 1) complete with four 138 kV breakers and associated equipment for the termination of two additional lines (KR2 and KR3) from Keeyask Switching Station. KR2 and KR3 will enter the west side of the station utilizing dead-ended steel structure with line switches. KR2 and KR3 lines will proceed to underground around the station and finally terminate to Bay 1. This is done to avoid complex line crossings into the station. Thirty-one 138 kV breakers will also need to be replaced due to fault levels exceeding existing breaker ratings.

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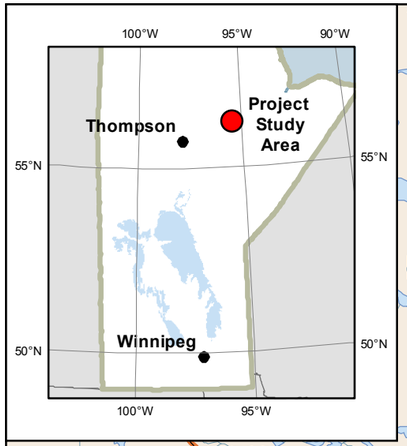


Manitoba Hydro

Keeyask Transmission Project

Project Infrastructure
- Project Study Area

Infrastructure
- Converter Station
- Generating Station (Proposed)
- Generating Station
- Bipole I and II (Existing 500 kV DC Line)
- Transmission Line

Landbase
- Community
- Provincial Highway
- Provincial Road
- Active Railway
- Abandoned Railway
- Resource Management Area
- First Nation
- Watercourse
- Waterbody

Coordinate System: UTM Zone 15N NAD83
Data Source: MBHydro, Stantec, ProvMB, NRCAN
Date Created: September 26, 2012

N

0 10 20 Kilometres
0 10 20 Miles

1:1,000,000

Project Study Area in Northern Manitoba

Map 1-1

2.0 METHODS AND PROCEDURES

2.1 STUDY AREA DEFINITION

The Keeyask Transmission Project (Map 1-1) is located in northern Manitoba, approximately 200 km northeast of Thompson. Socio-economic effects are often experienced at different geographic scales than effects to other components of the environment. Therefore, the socio-economic effects assessment considers different study areas than other disciplines. The socio-economic environment for the environmental assessment of the Project includes the following study areas:

- The **Project Study Area** extends from the Radisson Converter Station (approximately 6 km northeast of the town of Gillam), along the south shore of Stephens Lake, to the proposed Keeyask Generation Project. From this juncture, the PSA extends north across the Nelson River approximately 4 km and southward to a point about 3 km south of Manitoba Hydro 138 kV transmission line KN36. The southern boundary extends east back to Radisson and parallel to KN36. The PSA is located in the SLRMA. The community of Gillam is also in the PSA.

- The **Socio-Economic Project Study Area** includes the PSA (including the Town of Gillam) as well as the Census communities of Split Lake and Fox Lake (Bird). The First Nations and the Town of Gillam are included in this study area because residents and First Nations Members use areas in the SPSA for traditional activities such as hunting or trapping, they are most likely to experience effects related to jobs and business opportunities, they are most likely to experience interactions with non-resident construction workers and services provided by these communities may be affected by the Project[1].

- The **Northern Manitoba Study Area** is the broadest spatial scale used for the assessment. The Northern Manitoba Study Area includes Statistics Canada Census Divisions 19, 21, 22 and 23. Statistical information for this study area is provided primarily for comparison purposes.

2.2 DATA COLLECTION AND ANALYSIS

2.2.1 Overview of Information Sources and Data

This report addresses the Province of Manitoba's Environment Act Proposal Report Guidelines (Manitoba Conservation 2011) for the socio-economic environment. Heritage resources are the subject of a separate technical report. This report relies on information researched for and

[1] Members of other First Nations communities may also occasionally travel through or use areas in the SPSA.

compiled in the Socio-economic Environment Supporting Volume to the Keeyask Generation Project Environmental Impact Statement (Keeyask Hydropower Limited Partnership 2012). Aboriginal traditional knowledge (ATK) was provided in an evaluation report prepared by TCN and through workshops held in 2012 with FLCN. In addition, Manitoba Hydro is currently undertaking ATK studies with the Manitoba Metis Federation (MMF) and FLCN related to the project.

The TCN study (TCN 2011) was conducted using TCN's Overview of Water and Land Process, founded in TCN's Cree worldview, values and beliefs. The process involves open-ended discussions and interviews designed to encourage Members to provide as much information as possible in a relaxed, conversational atmosphere. TCN's report includes comments on the location of the proposed Construction Power line, the identification of TCN's preferred location for the proposed Generation Outlet Transmission lines and describes the perceived and real effects of the Project on TCN Members.

The MMF study includes coordinating and holding community meetings to provide information on the Project, reporting on Traditional Land Use and Knowledge Studies, developing and circulating communications to MMF members in the region, holding internal meetings with Metis community leadership, consultants, staff and advisors and the preparation of historical narrative and Metis perspective on their presence in the area.

The FLCN study includes describing the nature and extent of FLCN's historical and present use of the Keeyask Transmission Project footprint area; the impacts of the Project on current and future community activities; the impacts of the Project on plant and animal species that are culturally significant to Fox Lake, for example caribou, brook trout and medicinal plants; and the impacts of the Project on Fox Lake's potential treaty land entitlement selections.

Other sources of information relied on in the preparation of this technical report are government publications and datasets including:

- 2001 and 2006 Census of Canada statistics and indicators[1];
- Province of Manitoba registered trapline information; and
- Province of Manitoba mining data.

It should be noted that the methodology for collecting Census data changed in 2011. In 2011 Statistics Canada did not use a mandatory long-form questionnaire as part of the Census. Information previously collected by the mandatory long-form Census questionnaire was collected as part of the new voluntary National Household Survey. Further, as of the date this report was written, most of the 2011 National Household Survey data had not been publicly released. For these reasons, 2011 Census data has not been used in this analysis. This report

[1] It should be noted much of the data from the 2006 Census of Canada was suppressed for Split Lake and Fox Lake (Bird).

relies on 2001 and 2006 Census data, supplemented by information from other sources where available.

2.3 VALUED ENVIRONMENTAL COMPONENT SELECTION

Socio-economic valued environmental components (VECs) are aspects of the socio-economic environment that are valued by people. Further information on the use of VECs in the environmental assessment for the project is provided in Chapter 3 of the Environmental Assessment Report.

Valued environmental components for the Project were selected based on:

- A review of the Project description and a consideration of potential ways the Project might interact with the socio-economic environment[1];
- A review of recent environmental assessments for other linear projects in the area;
- A consideration of the VECs selected for the Keeyask Generation Project EIS[2]; and
- Information provided by TCN in their evaluation report and during workshops held with FLCN.

Based on these considerations, the following socio-economic VECs were identified:

- Land and Resource Use;
- Economy;
- Population, Infrastructure and Services; and
- Personal, Family and Community Life

Aspects of the socio-economic environment related to forestry and heritage resources are described in separate technical reports.

[1] Further discussion on potential pathways of effect of the Project on the socio-economic environment is provided in Section 5.
[2] These VECs were reviewed with the Keeyask Cree Nations (TCN, War Lake First Nation, York Factory First Nation and FLCN) during workshops held in 2008 (Keeyask Hydropower Limited Partnership 2012).

2.4 EVALUATION OF ALTERNATIVE ROUTES AND INFRASTRUCTURE

The alternative sites for each of the Project components were reviewed from a socio-economic perspective. Construction workforce requirements and potential employee complements are expected to be similar, regardless of which preferred routes or site options are selected. As a result, the potential effects of the project on the population, infrastructure and services and economy VECs are not expected to vary between the alternatives. Therefore the evaluation of alternatives from a socio-economic perspective focused on the land and resource use and personal, family and community life VECs.

Each of the proposed sites was reviewed, considering potential relative effects on land and resource use and personal, family and community life. Preferences and perspectives expressed by community members in TCN's evaluation report, during workshops with FLCN and during the public involvement program were considered as part of this evaluation. Where there was reason to prefer one alternative site or route option over others from a socio-economic perspective, this preference was noted and included as an input to the overall selection of preferred site and route options (Chapter 6 of the Environmental Assessment Report). Further discussion on the evaluation of alternative routes and sites is provided in section four of this technical report.

2.5 EFFECTS ASSESSMENT AND MITIGATION MEASURES

The environmental assessment involved identifying and analyzing potential effects associated with the preferred routes that could not be avoided during the route selection process. During the route selection process, detailed socio-economic and biophysical studies were conducted to determine potential effects more precisely. Potential effects and mitigative measures are detailed in Chapter 7 of the Environmental Assessment Report. Appropriate mitigation measures have been identified to reduce negative effects during all phases of Project development.

2.5.1 Residual Effects significance evaluation

Residual effects are the actual or anticipated Project effects that remain after considering mitigation and the combined effects of other past and existing developments and activities. Each potential effect on a VEC is initially evaluated using the following criteria:

- Direction or nature (i.e., positive, neutral or adverse) of the effect;
- Magnitude (i.e., severity) of the effect;

- Duration (temporal boundaries); and
- Geographic Extent (spatial boundaries).

The definitions for the above are provided in Chapter 3 of the EA Report.

3.0 STUDY AREA CHARACTERIZATION

This section provides an overview of the socio-economic environment. The environmental setting provides information necessary in order to understand and assess potential effects of the Project on the socio-economic environment. The description of the socio-economic study area focuses on the following VECs:

- Land and Resource Use: Including domestic resource use; commercial trapping; other commercial resource use and recreation.
- Economy: Including **labour force**, employment and unemployment, employment challenges, education levels and businesses in the communities.
- Population, Infrastructure and Services: Including community populations; transportation infrastructure; health and emergency services and other public services.
- Personal, Family and Community Life: Including governance, workplace health and safety, public safety and worker interaction, community health, aesthetics (the way the landscape looks) and culture and spirituality.

As noted in the introduction, there are several terms used throughout the technical report in relation to the communities in the SPSA.

- Split Lake is the reserve community for Tataskweyak Cree Nation.
- Tataskweyak Cree Nation refers to the First Nation that has Members living on-reserve in Split Lake, as well as off-reserve in Thompson, Winnipeg and other locations. TCN is also used to refer to the First Nation's leadership and community services provided by the First Nation.
- Fox Lake (Bird) is one of the reserve communities for Fox Lake Cree Nation.
- Fox Lake Cree Nation refers to the First Nation that has Members living on-reserve in the community of Fox Lake (Bird), on the A Kwis Ki Mahka Reserve near Gillam and off-reserve in Gillam, Thompson, Winnipeg and other locations. FLCN is also used to refer to the First Nation's leadership and services provided by the First Nation.
- Gillam is the primary service centre for the area. Many FLCN Members live in Gillam and on the nearby A Kwis Ki Mahka reserve.

3.1 LAND AND RESOURCE USE

Land and resource considers the way people in the area use the land and water for traditional purposes, commercial uses and recreation. This section focuses on existing land resource use activities in the SPSA including:

- Domestic resource use;
- Commercial trapping;
- Commercial fishing;
- Other commercial resource use;
- Protected areas; and
- Outdoor recreation.

Chapter 2 of the Environmental Assessment Report describes the land requirements and the land rights and easements Manitoba Hydro will obtain related to the Project.

3.1.1 Domestic Resource Use

Domestic resource use activities are important to people and communities in the North. These activities reflect a way of being in and an understanding of the world and as such, are important to people. For this reason, **country foods** are an important part of the diet for many people in the SPSA. Domestic resource use can also provide important additions to earned income and help offset the high cost of living in the north. Domestic resource use is also strongly linked to First Nation culture and spirituality.

Domestic resource use activities that occur in the SPSA include:

- Fishing (for pickerel, lake whitefish, jackfish and other species);
- Hunting (for waterfowl, moose, caribou and other species); and
- Gathering (for a variety of berries, sweet grass, medicinal herbs and other plants) (Keeyask Hydropower Limited Partnership 2012).

TCN describes the importance of domestic resource use activities to their community stating:

> Hunting, fishing, gathering and trapping were always integral to our lives because these activities were life-sustaining relationships, yet their value as cultural

> activities does not depend upon the number of animals taken or berries gathered, but the affirmation they provide to the activity (TCN 2011).

TCN's evaluation report for the KTP notes that TCN Members travel extensively throughout the SPSA and use the right-of-way for the CN Rail line between Wivenhoe and Gillam as well as the right-of-way for the existing transmission lines KN36 and R26K (TCN 2011). TCN's evaluation report also documents a variety of traditional land use, occupancy and cultural sites in the Project area including: gathering places, cabins, graves and sacred sites, trails, fishing areas, trapping areas, hunting areas, medicinal plant collecting, trails, fish weirs, geese blinds and boat launches (TCN 2011). TCN notes several land use objectives approved by Chief and Council including increasing opportunities for people to hunt, fish and gather within the SLRMA (TCN 2011).

FLCN Members also engage in domestic resource use activities in the SLRMA. FLCN Members hunt for moose and caribou in the areas around Stephens Lake. FLCN has also identified Cache Lake, the Butnau, Moswakot and Kettle rivers as important domestic resource use areas (Keeyask Hydropower Limited Partnership 2012).

3.1.2 Commercial Trapping

The Registered Trapline System is a provincial commercial furbearer harvest management system whereby a person is granted the exclusive opportunity to commercially harvest furbearing animals in a particular area. Trapping is generally performed in winter when it is safe to travel on frozen waterbodies and when fur is in prime condition, generally from mid-November to mid-March, though this varies somewhat by species. For example, American marten, are generally at their prime prior to the New Year, while beaver are best later in the winter. Trappers can secure a permit to build cabins on their trapline from which to stage their activities (Keeyask Hydropower Limited Partnership 2012).Portions of traplines 7, 8, 9, 15, 17 and 65 fall within the SPSA:

- Trapline 7 is registered to a Member of TCN;
- Trapline 8 was unallocated as of July 2009;
- Trapline 9 is registered to a Member of FLCN;
- Trapline 15 was registered to a TCN Member in 2012;
- Trapline 17 is registered to a FLCN Member; and
- Trapline 65 is designated as a community line for Gillam youth (Keeyask Hydropower Limited Partnership 2012, Berezanski pers. comm. 2012).

Harvest data for these traplines were obtained from Manitoba Conservation for the years 2000/01 through 2010/11. The total number of trapped animals reported for these traplines

ranged between 49 (2006/07) and 592 (2008/09). The average annual number of trapped animals across these six traplines for the most commonly reported trapped species were marten (232), mink (13) and beaver (13) (Berezanski pers. comm. 2012). Average annual harvest values for all traplines from 1996 to 2008 was approximately $2,000 (Keeyask Hydropower Limited Partnership 2012).

3.1.3 Commercial Fishing

Twenty-two lakes listed in the 2008 Manitoba Harvest Schedule are located in the SLRMA. Commercial fishing has historically occurred at Gull Lake and Stephens Lake. However, since 1997, commercial fishing activity has occurred only at Split Lake and Assean Lake, outside the SPSA (Keeyask Hydropower Limited Partnership 2012).

A Gillam resident holds a license authorizing catch in Stephens Lake and a dealer's license (authorizing local sale of fish). Due to the unique nature of these licenses, production from this fishery is not published in Freshwater Fish Marketing Corporation records and a quota for Stephens Lake is not published in the Manitoba commercial fishing harvest schedule. The primary target of this fishery is pickerel which is sold directly to restaurants and individuals in Gillam and Churchill. The inlet of Stephens Lake is the targeted location of this fishing operation. The fishery is staged from three cabins located on an island approximately 4 km downstream from the proposed Keeyask generating station (Keeyask Hydropower Limited Partnership 2012).

3.1.4 Other Commercial Resource Use

3.1.4.1 Mining

There are no operating mines within the SPSA, however there are several mining claims to the north of Split Lake (see Map 3-1)(Government of Manitoba 2012). One exploration license has been granted on the north shore of Stephens Lake. In February 2008 a Mineral Exploration License for a 12,341 hectare area on the north side of Stephens Lake was granted to Exploratus Ltd. Manitoba Hydro has applied for a number of quarry leases on the north and south sides of the Nelson River in the vicinity of the north and south access roads in anticipation of construction of the Keeyask Generation Project.

3.1.4.2 Lodges and Outfitters

Lodges are defined under *The Resource Tourism Operators* Act as a 'facility of a permanent or semi-permanent nature that accommodates nine or more persons". Lodge operators often provide additional services such as provision of equipment (boats and gas) as well as guiding services for the purposes of hunting and/or fishing. Outfitters provide similar services in connection with hunting and/or fishing but accommodations are usually at outcamps which

accommodate less than nine persons. Lodges and outfitting companies identified as operating in proximity to the SPSA include:

- Dunlop's Lodge at the mouth of the Little Churchill River on Lake Waskaiowaka. Dunlop's focuses on catch and release trophy jackfish and pickerel fishing, but also offers twelve non-resident bear hunts. Dunlop's also has outposts located on Pelletier and Campbell Lakes;
- Ace Wilderness Guiding operates out of Gillam. Ace Wilderness Guiding offers spring bear hunts to U.S. resident clients along the PR 280 corridor from Stephens Lake to Gillam and on surrounding roads south of the Nelson River; and
- Fox River Outfitters, located in Gillam. Fox River Outfitters offers up to 20 moose hunts and eight bear hunts on the Fox River each year. Clients are typically US residents. (Keeyask Hydropower Limited Partnership 2012).

3.1.5 Protected Areas

Areas can be permanently protected under four Manitoba Acts as Provincial Parks, Ecological Reserves, Wildlife Management Areas and Provincial Forests. Areas of Special Interest is a term used to describe "candidate" sites which have not been protected in any formal manner but have a high potential to protect groupings of enduring features and associated natural and cultural values. There are no protected areas such as national parks, provincial parks, ecological reserves or wildlife management areas in the SPSA. There are no candidate Areas of Special Interest in the SPSA.

3.1.6 Outdoor Recreation

Outdoor recreation in the SPSA includes fishing, hunting, snowmobiling and other activities.

3.1.6.1 Recreational Fishing

Recreational fishing usually occurs at areas accessible by road and trail. Ice fishing shacks have been observed on Stephens Lake. Gillam residents have also reported that they travel to Atkinson and Butnau lakes for ice fishing (Keeyask Hydropower Limited Partnership 2012).

3.1.6.2 Recreational Hunting

The SPSA covers portions of Game Hunting Areas (GHA) 3 and 9. GHAs 3 and 9 have a general resident (person living in Manitoba) rifle season for Moose from mid-September to mid-October and the first half of December. The season for archery resident licenses in GHA 9 for moose spans from late August to mid-September. Both licenses are limited to one bull or calf moose. A camp on Stephens Lake is known to be used for moose hunting (Keeyask Hydropower Limited Partnership 2012).

All of northern Manitoba is classified as Zone A relating to bear and gray wolf hunting zones with a season from late April to late June and late August to early October. In GHA 3, only residents of Manitoba can hunt caribou with a valid license. Seventy five licenses are issued for GHA 3 annually and are generally sold within a day. Resident caribou hunting is known to occur along the right-of-way for KN36 (Keeyask Hydropower Limited Partnership 2012).

3.1.6.3 Other Recreation Activities

TCN has 2 parcels of fee simple land on the northwest shore of Stephens Lake for future cottage development. A number of residents of Gillam and Members of FLCN have cabins on Stephens Lake. During open water conditions Stephens Lake can be accessed by boat from a marina in Gillam or other locations. In the winter access to Stephens Lake can occur by snowmobile. Recreational snowmobiling occurs on trails around Gillam. Trails are groomed approximately every two weeks depending on the snow conditions (Keeyask Hydropower Limited Partnership 2012).

3.2 ECONOMY

This section provides an overview of the economies for communities in the SPSA. The discussion relies, in part, on Statistics Canada census information. Caution should be used when interpreting these data because:

- The data are subject to random rounding procedures to preserve confidentiality; and
- Data for some communities were suppressed for the 2006 Census of Canada due to concerns about data quality and low response rates.

Qualitative information is provided based on information available in the Keeyask Generation Project Environmental Impact Statement.

Topics reviewed in this section include:

- Labour force characteristics (including participation rates, employment rates and unemployment rates;
- Income levels;
- Occupation classifications;
- Education levels and field of study;
- Challenges to employment; and
- Business.

3.2.1 Labour Force Characteristics

Table 3-1 and Table 3-2 summarize labour force characteristics for communities in the SPSA. Information for the Northern Manitoba Study Area and Manitoba are provided for comparison purposes. In 2001 Split Lake and Fox Lake (Bird) had lower **participation rates** than the Northern Manitoba Study Area and Manitoba. 2006 participation rates for Split Lake and Fox Lake (Bird) were not available. The 2001 and 2006 participation rates for Gillam were higher than the participation rates for the Northern Manitoba Study Area and Manitoba.

Employment rates in 2001 were lower in Split Lake and Fox Lake (Bird) than the employment rates for the Northern Manitoba Study Area and Manitoba. These employment rates are consistent with many Northern Manitoba First Nations communities that have young and growing labour forces (Keeyask Hydropower Limited Partnership 2012). 2006 employment rates for Split Lake and Fox Lake (Bird) were not available. Employment rates for Gillam were higher in both 2001 and 2006 than employment rates in the Northern Manitoba Study Area and Manitoba.

Unemployment rates in 2001 were higher in Split Lake and Fox Lake (Bird) than the unemployment rates for the Northern Manitoba Study Area and Manitoba. 2006 unemployment rates for Split Lake and Fox Lake (Bird) were not available. Unemployment rates for 2001 and 2006 in Gillam were lower than the Northern Manitoba Study Area, but higher than Manitoba as a whole.

Table 3-1: Labour Force Characteristics (2001)

Characteristics[1,2,3]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[4]	Manitoba
Potential Labour Force (15 years and older)[5]	990	90	815	54,945	869,315
Active Labour Force - Employed[6]	290	35	580	27,445	549,990
Active Labour Force - Unemployed[7]	295	10	40	5,665	35,430
Not in the labour force[8]	405	50	195	21,825	283,895
Participation rate[9]	59.1%	50%	76.7%	60.3%	67.3%
Employment rate[9]	29.3%	38.9%	71.2%	49.9%	63.3%
Unemployment rate[9]	50.4%	22.2%	6.4%	17.1%	6.1%

Source: Statistics Canada 2002.

Notes:

1. 'In the labour force' refers to persons who were either employed or unemployed during the week prior to the Census Day. Enumeration occurred May 15 for the 2001 Census.
2. Labour force characteristics for the 2001 Census derived from 20% sample data.
3. The figures shown in the tables have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of '5', and in some cases '10'.
4. The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.
5. Full-time and part-time students were differentiated in the 2001 Census year, and since 1991 "persons on lay-off or with a new job to start or who looked for full-time work in the past 4 weeks and were in full-time attendance at elementary or secondary school were considered unavailable for work, and therefore, not in the labour force." (Source: Statistics Canada Appendix E Comparability of labour force activity data with those of previous Censuses (1971 to 2006) and with the Labour Force Survey).
6. Employed refers to persons 15 years and over, excluding institutional residents who, during the week prior to Census Day: a) did any work at all for pay or in self-employment or without pay in a family farm, business or professional practice; or, were absent from their jobs or business, with or without pay, for the entire week because of vacation, an illness, a labour dispute at their place of work, or any other reasons. Northern Region calculated by InterGroup Consultants based on Statistics Canada employment rates.
7. Unemployed refers to persons who, during the week prior to Census day, were without paid work or without self-employment work and were available for work and either: a) had actively looked for paid work in the past four weeks; or b) were on temporary lay-off and expected to return to their job; or c) had definite arrangements to start a new job in four weeks or less. Northern Region calculated by InterGroup Consultants based on Statistics Canada unemployment rates.
8. Not in the labour force refers to persons who, in the week prior to Census Day, were neither employed nor unemployed. It includes students, homemakers, retired workers, seasonal workers in an 'off' season who were not looking for work, and persons who could not work because of a long-term illness or disability.
9. Participation Rate refers to the number of people in the labour force in the week prior to Census Day, as a percentage of the population 15 years and over, excluding institutional residents. The Employment Rate refers to the number of people employed in the week prior to Census Day as a percentage of the total population 15 years and over, excluding institutional residents. The Unemployment Rate refers to the number of people unemployed in the week prior to Census Day expressed as a percentage of the labour force. For the Northern Region, each is calculated as a weighted average of the divisions.

Table 3-2: Labour Force Characteristics (2006)

Characteristics[1,2,3]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[4]	Manitoba
Potential Labour Force (15 years and older)[5]	n/a [10]	n/a	855	57,720	908,450
Employed [6]	n/a	n/a	605	27,865	577,710
Unemployed[7]	n/a	n/a	55	5,485	33,575
Not in the labour force [8]	n/a	n/a	190	24,365	297,170
Participation rate[9]	n/a	n/a	77.8%	60.1%	67.3%
Employment rate[9]	n/a	n/a	70.8%	51.2%	63.6%
Unemployment rate[9]	n/a	n/a	8.3%	15.0%	5.5%

Source: Statistics Canada 2007.

Notes:

1. In the labour force' refers to persons who were either employed or unemployed during the week prior to the Census Day. Enumeration occurred June 4, in the 1991 Census, May 15 for the 2001 Census and May 16th, for the 2006 Census.
2. Labour force characteristics for the 2006 Census derived from 20% sample data.
3. The figures shown in the tables have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of '5', and in some cases '10'.
4. The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.
5. In 2006, full-time and part-time students were not differentiated, and all students, either in elementary or secondary school who were not 'Employed', were classified as 'Not available for work'. Full-time and part-time students were differentiated in the 2001 Census year, and since 1991 "persons on lay-off or with a new job to start or who looked for full-time work in the past 4 weeks and were in full-time attendance at elementary or secondary school were considered unavailable for work, and therefore, not in the labour force." (Source: Statistics Canada Appendix E Comparability of labour force activity data with those of previous Censuses (1971 to 2006) and with the Labour Force Survey).
6. Employed refers to persons 15 years and over, excluding institutional residents who, during the week prior to Census Day: a) did any work at all for pay or in self-employment or without pay in a family farm, business or professional practice; or, were absent from their jobs or business, with or without pay, for the entire week because of vacation, an illness, a labour dispute at their place of work, or any other reasons. Northern Region calculated by InterGroup Consultants as weighted average based on Statistics Canada employment rates.
7. Unemployed refers to persons who, during the week prior to Census day, were without paid work or without self-employment work and were available for work and either: a) had actively looked for paid work in the past four weeks; or b) were on temporary lay-off and expected to return to their job; or c) had definite arrangements to start a new job in four weeks or less. Northern Region calculated by InterGroup Consultants as weighted average based on Statistics Canada unemployment rates.
8. Not in the labour force refers to persons who, in the week prior to Census Day, were neither employed nor unemployed. It includes students, homemakers, retired workers, seasonal workers in an 'off' season who were not looking for work, and persons who could not work because of a long-term illness or disability.
9. Participation Rate refers to the number of people in the labour force in the week prior to Census Day, as a percentage of the population 15 years and over, excluding institutional residents. The Employment Rate refers to the number of people employed in the week prior to Census Day as a percentage of the total population 15 years and over, excluding institutional residents. The Unemployment Rate refers to the number of people unemployed in the week prior to Census Day expressed as a percentage of the labour force. For the Northern Region, each is calculated as a weighted average of the divisions.

n/a indicates that data is unavailable or suppressed.

3.2.2 Income Levels

Table 3-3 and Table 3-4 provide information on personal, family and household income for communities in the SPSA. Information for the Northern Manitoba Study Area and Manitoba are provided for comparison purposes. Statistics Canada reports three types of income:

- Personal income: Refers to money income received during the calendar year prior to the Census year for an individual;
- Family income: Refers to money income for Census families during the calendar year prior to the Census year; and
- Household income: Refers to money income for Census households during the calendar year prior to the Census year.

All categories of income in Split Lake were lower in 2001 than in the Northern Manitoba Study Area and Manitoba. 2006 information for Split Lake was not available. Income information for Fox Lake (Bird) was not available for either 2001 or 2006. All categories of income for Gillam were higher in both 2001 and 2006 than income in the Northern Manitoba Study Area and Manitoba.

Table 3-3: Average Personal, Family and Household Income (2001)

Characteristics[1,2]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[3]	Manitoba
Average Personal income[4]	$ 12,605	n/a[5]	$ 37,928	$ 21,148	$ 26,416
Average family income[6]	$ 30,047	n/a	$ 77,582	$ 46,358	$ 59,005
Average household income[7]	$ 34,086	n/a	$ 71,199	$ 46,704	$ 50,756

Source: Statistics Canada 2002.

Notes:

1. All income variables derived from 20% sample data.
2. Income variables do not account for inflation.
3. The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22 and 23.
4. Total income (i.e. personal income) refers to the total money income received during the calendar year prior to the Census year. Sources of income are: wages and salaries, net farm income; net non-farm income from unincorporated business and/or professional practice; child benefits; Old Age Security pension and Guaranteed Income Supplement; benefits from Canada Pension Plan or Quebec Pension Plan; benefits from Employment insurance; other income from government sources; dividends, interest on bonds, deposits and savings certificates and other investment income; retirement pensions, superannuation and annuities, including those from RRSPs and RRIFs; and other money income. Prior to the 2001 Census, benefits from wage-loss replacement plans or income-maintenance insurance plans were classified as 'Other money income'. Not included in all Census years as total income: income tax refunds, lump sum inheritance payments, gambling revenue, lump sum insurance policy settlements, capital gains or losses, receipts from the sale of property or belongings, loan repayments, property tax rebates or refunds of pension contributions.
5. n/a indicates that the data is unavailable or suppressed.
6. Average Family Income refers to the weighted mean total income of Census families. Average income is calculated by Statistics Canada from unrounded data by dividing the aggregate income of a specified group of families by the number of families in that respective group, whether or not they reported income.
7. Average Household Income refers to the weighted mean total income of households. Average income is calculated by Statistics Canada from unrounded data by dividing the aggregate income of a specified group of households (e.g. two-person households) by the number of households in that respective group, whether or not they reported income.

Table 3-4: Average Personal, Family and Household Income (2006)

Characteristics[1,2]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[3]	Manitoba
Average Personal income[4]	n/a	n/a [5]	$ 45,959	$ 24,809	$ 31,320
Average family income[6]	n/a	n/a	$ 91,662	$ 57,881	$ 72,240
Average household income[7]	n/a	n/a	$ 85,931	$ 52,929	$ 60,242

Source: Statistics Canada 2007.

Notes:

1. All income variables derived from 20% sample data.
2. Income variables do not account for inflation.
3. The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22 and 23.
4. Total income (i.e. personal income) refers to the total money income received during the calendar year prior to the Census year. Sources of income are: wages and salaries, net farm income; net non-farm income from unincorporated business and/or professional practice; child benefits; Old Age Security pension and Guaranteed Income Supplement; benefits from Canada Pension Plan or Quebec Pension Plan; benefits from Employment insurance; other income from government sources; dividends, interest on bonds, deposits and savings certificates and other investment income; retirement pensions, superannuation and annuities, including those from RRSPs and RRIFs; and other money income. The 2006 Census was updated to include taxable benefits, research grants and royalties as wages and salaries. Prior Census classified research grants and royalties 'Other Money Income', and taxable benefits were excluded. Not included in all Census years as total income: income tax refunds, lump sum inheritance payments, gambling revenue, lump sum insurance policy settlements, capital gains or losses, receipts from the sale of property or belongings, loan repayments, property tax rebates or refunds of pension contributions.
5. n/a indicates that the data is unavailable or suppressed.
6. Average Family Income refers to the weighted mean total income of Census families. Average income is calculated by Statistics Canada from unrounded data by dividing the aggregate income of a specified group of families by the number of families in that respective group, whether or not they reported income.
7. Average Household Income refers to the weighted mean total income of households. Average income is calculated by Statistics Canada from unrounded data by dividing the aggregate income of a specified group of households (e.g. two-person households) by the number of households in that respective group, whether or not they reported income.

3.2.3 Occupation Classifications

Table 3-5 and Table 3-6 provide information on occupation classifications for communities in the SPSA. Information for the Northern Manitoba Study Area and Manitoba are provided for comparison purposes.

In 2001, the most common occupation categories in Split Lake were sales and service occupations (20.5 per cent); trades, transport and equipment operators and related occupations (15.4 per cent) and occupations in social science, education, government, service and religion (13.7 per cent). 2006 data for Split Lake were not available.

In 2001, the most common occupation category in Fox Lake (Bird) was sales and service occupations. Other occupation categories reported included business, finance and administration occupations; occupations in social science, education, government service and religion; and trades, transport and equipment operators and related occupations. 2006 data for Fox Lake (Bird) were not available.

In 2001, the most common occupation categories in Gillam were trades, transport and equipment operators and related occupations (33.6 per cent); sales and service occupations

(19.2 per cent); and business, finance and administration occupations (12.0 per cent). In 2006 the most common occupation categories in Gillam were trades, transport and equipment operators and related occupations (32.3 per cent); sales and service occupations (21.1 per cent); and natural and applied sciences and related occupations (12.8 per cent).

Table 3-5: Occupation Classification (2001)

Characteristics[1,2,3]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[4]	Manitoba
Total labour force 15 years and over	585	40	625	33,120	585,420
Occupation - Not applicable[5]	195 (33.3%)	0 (0.0%)	10 (1.6%)	1,935 (5,8%)	8,075 (1.4%)
All occupations[6]	395 (67.5%)	40 (100%)	615 (98.4%)	31,180 (94.1%)	577,345 (98.6%)
Management occupations	30 (5.1%)	0 (0.0%)	45 (7.2%)	2,395 (7.2%)	50,850 (8.7%)
Business, finance and administration occupations	30 (5.1%)	10 (25%)	75 (12.0%)	3,600 (10.9%)	101,940 (17.4%)
Natural and applied sciences and related occupations	10 (1.7%)	0 (0.0%)	55 (8.8%)	1,210 (3.6%)	26,695 (4.6%)
Health occupations	15 (2.6%)	0 (0.0%)	30 (4.8%)	1,380 (4.2%)	36,690 (6.3%)
Occupations in social science, education, government service and religion	80 (13.7%)	10 (25%)	55 (8.8%)	3,940 (11.9%)	45,890 (7.8%)
Occupations in art, culture, recreation and sport	0 (0.0%)	0 (0.0%)	0 (0.0%)	380 (1.1%)	12,165 (2.1%)
Sales and service occupations	120 (20.5%)	15 (37.5%)	120 (19.2%)	8,685 (26.2%)	139,940 (23.9%)
Trades, transport and equipment operators and related occupations	90 (15.4%)	10 (25%)	210 (33.6%)	5,710 (17.2%)	85,640 (14.6%)
Occupations unique to primary industry	10 (1.7%)	0 (0.0%)	10 (1.6%)	2,615 (7.9%)	40,580 (6.9%)
Occupations unique to processing, manufacturing and utilities	10 (1.7%)	0 (0.0%)	10 (1.6%)	1,270 (3.8%)	36,945 (6.3%)

Source: Statistics Canada 2002.

Notes:

1. This table is based on data from the 2001 National Occupational Classification for Statistics [NOC-S 2001] data set.
2. The 2001 Census data on education is based on a 20% sample data. However, on Indian reserves and in remote areas, the attempt was made to collect data from 100% of the population.
3. The figures shown in the table have been subjected to random rounding to a multiple of “5” and in some cases “10”.
4. The Northern Manitoba Study Area is Defined as Statistics Canada Census Divisions 19, 21, 22, and 23.
5. Refers to Unemployed persons 15 years and over who have never worked for pay or in self-employment or who had last worked prior to January 1, 2000.
6. Refers to the experienced labour force population: includes persons who were employed and persons who were unemployed who worked for pay or in self-employment since January 1, 2000.

Table 3-6: Occupation Classification (2006)

Characteristics[1,2,3,4]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[4]	Manitoba
Total labour force 15 years and over	n/a [7]	n/a	665	33,365	611,280
Occupation - Not applicable[5]	n/a	n/a	10 (1.5%)	2,135 (6.4%)	9,130 (1.5%)
All occupations[6]	n/a	n/a	655 (98.5%)	31,225 (93.6%)	60,2150 (98.5%)
Management occupations	n/a	n/a	35 (5.3%)	2,485 (7.4%)	51,355 (8.4%)
Business, finance and administration occupations	n/a	n/a	80 (12.0%)	3,465 (10.4%)	104,440 (17.1%)
Natural and applied sciences and related occupations	n/a	n/a	85 (12.8%)	1,090 (3.3%)	29,630 (4.8%)
Health occupations	n/a	n/a	15 (2.3%)	1,675 (5.0%)	40,455 (6.6%)
Occupations in social science, education, government service and religion	n/a	n/a	40 (6.0%)	3,875 (11.6%)	52,890 (8.7%)
Occupations in art, culture, recreation and sport	n/a	n/a	10 (1.5%)	370 (1.1%)	13,955 (2.3%)
Sales and service occupations	n/a	n/a	140 (21.1%)	9,170 (27.5%)	148,340 (24.3%)
Trades, transport and equipment operators and related occupations	n/a	n/a	215 (32.3%)	5,465 (16.4%)	90,285 (14.8%)
Occupations unique to primary industry	n/a	n/a	0 (0.0%)	2,655 (8.0%)	38,900 (6.4%)
Occupations unique to processing, manufacturing and utilities	n/a	n/a	35 (5.3%)	960 (2.9%)	31,900 (5.2%)

Source: Statistics Canada 2007.
Notes:

1. Statistics Canada currently uses the National Occupational Classification for Statistics 2006 – NOC-S 2006. The National Occupational Classification identifies jobs by type; and people's descriptions of their work are coded.
2. The 2006 Census data on education is based on a 20% sample data. However, on Indian reserves and in remote areas, the attempt was made to collect data from 100% of the population.
3. The figures shown in the table have been subjected to random rounding to a multiple of "5" and in some cases "10".
4. The Northern Region is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.
5. Refers to Unemployed persons 15 years and over who have never worked for pay or in self-employment or who had last worked prior to January 1, 2005.
6. Refers to the experienced labour force population: includes persons who were employed and persons who were unemployed who worked for pay or in self-employment since January 1, 2005.

n/a indicates that data is unavailable or suppressed.

3.2.4 Education Levels and Field of Study

Table 3-7 and Table 3-8 provide information on education levels for communities in the SPSA. Information for the Northern Manitoba Study Area and Manitoba are provided for comparison purposes.

In 2001, the proportion of the population 20 years and over with less than a high school certificate was 60.9 per cent in Split Lake and 62.5 per cent in Fox Lake (Bird). Both of these percentages are higher than the Northern Manitoba Study Area and Manitoba averages. 2006 data were not available for Split Lake and Fox Lake (Bird).

In 2001, the proportion of the Gillam population 20 years and over with less than a high school certificate was 29.0 per cent. This figure is lower than the Northern Manitoba Study Area and Manitoba averages. In 2006, the proportion of the Gillam population 15 years and over with less than a high school certificate was 31.0 per cent. This figure is lower than the Northern Manitoba Study Area average, but higher than the Manitoba average. 2001 and 2006 figures are not directly comparable because the population ages included in the surveys are different between the two years.

Table 3-7: Education Levels (2001)

Characteristics[1,2]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[3]	Manitoba
Total population 20 years and over	845	80	725	47,555	789,615
Less than high school certificate[4]	515 (60.9%)	50 (62.5%)	210 (29.0%)	22,910 (48.2%)	271,895 (34.4%)
High school certificate or equivalent[5]	60 (7.1%)	0 (0.0%)	80 (11.0%)	4,045 (8.5%)	89,725 (11.4%)
Trades certificate or diploma	55 (6.5%)	15 (18.8%)	150 (20.7%)	6,160 (13.0%)	92,545 (11.7%)
Postsecondary non-university certificate or diploma[6]	60 (7.1%)	10 (12.5%)	140 (19.3%)	5,240 (11.0%)	112,870 (14.3%)
University certificate or diploma[7]	20 (2.4%)	0 (0.0%)	15 (2.1%)	665 (1.4%)	19,270 (2.4%)
University degree[8]	40 (4.7%)	0 (0.0%)	70 (9.7%)	3,715 (7.8%)	113,150 (14.3%)
College or University without certificate or diploma[9]	100 (11.8%)	10 (12.5%)	70 (9.7%)	4,840 (10.2%)	90,160 (11.4)%

Source: Statistics Canada 2002.

Notes:

1. 'Highest certificate, diploma or degree' refers to the highest certificate, diploma or degree the individual has completed based primarily on time spent 'in-class.' For high school graduates, a university education is considered to be a higher level of education than a college diploma, while a college education is considered to be a higher level of education than a trade. Although some trades requirements may take as long or longer to complete than a given college or university program, the majority of time acquiring trade certification may on-the-job, as opposed to being in a classroom.
2. Education variables for the 2001 Census derived from 20% data.
3. The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.
4. The 2001data set used the education categories “Grades 9-13 without secondary certificate” and “Less than grade 9”. Data for these education categories have been placed under “Less than high school certificate”. 'High school certificate or equivalent' includes persons who have graduated from a secondary school or equivalent. Excludes persons with a postsecondary certificate, diploma or degree.
5. The 2001 data set used the education category “Grades 9-13 with high school graduation certificate”. Data for this education category has been placed under “High school certificate or equivalent”.
6. The 2001 data set used the education category “College – with certificate or diploma”. Data for this education category has been placed under “Postsecondary non-university certificate or diploma”.
7. The 2001 data set used the education category “University - with certificate or diploma”. Data for this education category has been placed under “University certificate or diploma”.
8. The 2001 data set used the education category “University - with bachelor’s degree or higher”. Data for this education category has been placed under “University degree”.
9. For 2001, the categories not reported in the table are “College-without certificate or diploma” and “University without certificate or diploma.”

Table 3-8: Education Levels (2006)

Characteristics[1,2,3]	Split Lake	Fox Lake	Gillam	Northern Region[4]	Manitoba
Total population 15 and over	n/a[5]	n/a	855	57,715	908,455
Less than high school certificate[6]	n/a	n/a	265 (31.0%)	30,320 (52.5%)	267,740 (29.5%)
High school certificate or equivalent[7]	n/a	n/a	160 (18.7%)	10,105 (17.5%)	242,200 (26.7%)
Trades certificate or diploma[8]	n/a	n/a	125 (14.6%)	4,995 (8.7%)	885,560 (9.7%)
Postsecondary non-university certificate or diploma[9]	n/a	n/a	190 (22.2%)	6,495 (11.3%)	136,740 (15.1%)
University certificate or diploma[10]	n/a	n/a	40 (4.7%)	2,585 (4.5%)	53,905 (5.9%)
University degree[11]	n/a	n/a	65 (7.6%)	3,240 (5.6%)	119,295 (13.1%)

Source: Statistics Canada 2007.

Notes:

1. 'Highest certificate, diploma or degree' refers to the highest certificate, diploma or degree the individual has completed based primarily on time spent 'in-class.' For high school graduates, a university education is considered to be a higher level of education than a college diploma, while a college education is considered to be a higher level of education than a trade. Although some trades requirements may take as long or longer to complete than a given college or university program, the majority of time acquiring trade certification may on-the-job, as opposed to being in a classroom.
2. Education variables for the 2006 Census derived from 20% data.
3. The 2006 Census contains several age groups including 15-24, 25-64, and 65 and over by highest certificate, diploma, or degree. The populations within these age groups were added together to arrive at the total.
4. The Northern Region is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.
5. n/a indicates that data is unavailable or suppressed.
6. The 2006 data set used the education category “No certificate diploma or degree”. Data for this education category has been placed under “Less than high school certificate”.
7. 'High school certificate or equivalent' includes persons who have graduated from a secondary school or equivalent. Excludes persons with a postsecondary certificate, diploma or degree.
8. The 2006 data set used the education category “Apprenticeship or trades certificate or diploma”. Data for this education category has been placed under “Trades certificate or diploma”.
9. The 2006 data set used the education category “College, CEGEP or other non-university certificate or diploma”. Data for this education category has been placed under “Postsecondary non-university certificate or diploma”.
10. The 2006 data set used the education categories “University certificate or diploma below the bachelor level” and “University certificate or diploma above the bachelor level”. Data for these education categories have been placed under “University certificate or diploma”.
11. The 2006 data set used the education categories “Bachelor’s degree,” “Degree in medicine, dentistry, veterinary medicine or optometry,” “Master’s degree” and “Earned doctorate”. Data for these education categories have been placed under “University degree”.

Table 3-9 and Table 3-10 provide information on major field of study for communities in the SPSA. Information for the Northern Manitoba Study Area and Manitoba are provided for comparison purposes.

In Split Lake in 2001, the most commonly reported postsecondary fields of study for males were applied science technologies and trades (45 per cent); educational, recreational and counseling services (25 per cent) and commerce, management and business administration (10 per cent). The most commonly reported postsecondary fields of study for females were education, recreational and counseling services (37.5 per cent); commerce, management and business administration (25 per cent) and social sciences and related fields (12.5 per cent). Data for 2006 were not available.

In Fox Lake (Bird) in 2001, the most commonly reported postsecondary fields of study for males were not available due to small sample sizes and random rounding. The most commonly reported postsecondary fields of study for females were educational, recreational and counseling services and social sciences and related fields. Percentages were not calculated due to the small sample sizes. Data for 2006 were not available.

In Gillam in 2001, the most commonly reported postsecondary fields of study for males were applied science, technology and trades (74.4 per cent); engineering and applied sciences (7.0 per cent) and commerce, management and business administration (7.0 per cent). The most commonly reported postsecondary fields of study for females were commerce, management and business administration (28.1 per cent); educational, recreational and counseling services (25.0 per cent) and health professions and related technologies (18.8 per cent).

In Gillam in 2006, the most commonly reported postsecondary fields of study for males were architecture, engineering and related technologies (73.0 per cent) and personal, protective and transportation services (8.1 per cent). The most commonly reported postsecondary fields of study for females were education (25.0 per cent); business, management and public administration (21.9 per cent) and social and behavioural sciences and law (15.6 per cent). 2001 and 2006 figures are not directly comparable because of differences in the survey methods and categories.

Table 3-9: Major Field of Study (2001)

Characteristics[1,2]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[3]	Manitoba
Total population of males with postsecondary qualifications	**100**	**10**	**215**	**7,930**	**164,800**
Educational, recreational and counselling services	25	0	0	855	11,730
Fine and applied arts	0	0	0	105	5,475
Humanities and related fields	0	0	10	250	8,285
Social sciences and related fields	0	0	10	620	14,800
Commerce, management and business administration	10	0	15	685	24,670
Agricultural, biological, nutritional, and food sciences	0	0	0	180	11,015
Engineering and applied sciences	0	0	15	250	8,095
Applied science technologies and trades	45	0	160	4,510	65,885
Health professions and related technologies	0	0	10	305	8,620
Mathematics, computer and physical sciences	0	0	10	170	6,035
No specialization	0	0	0	15	190
Total population of females with postsecondary qualifications	**80**	**15**	**160**	**7,905**	**175,055**
Educational, recreational and counselling services	30	10	40	1,910	29,530
Fine and applied arts	0	0	10	300	12,325
Humanities and related fields	0	0	10	240	9,085
Social sciences and related fields	15	10	10	645	16,645
Commerce, management and business administration	20	0	45	2,115	46,895
Agricultural, biological, nutritional, and food sciences	0	0	0	275	7,285
Engineering and applied sciences	0	0	0	65	1,460
Applied science technologies and trades	0	0	10	520	8,155
Health professions and related technologies	10	0	30	1,690	40,135
Mathematics, computer and physical sciences	0	0	0	105	3,345
No specialization	0	0	0	35	195

Source: Statistics Canada 2002.

Notes:

1. Population with postsecondary qualifications by major field of study is based on 20% sample data.
2. Data is rounded using a random rounding procedure, which may result in the reported count having been rounded by 5, or occasionally, 10. Columns may not add due to rounding.
3. The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.

Table 3-10: Major Field of Study (2006)

Characteristics[1,2]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[3]	Manitoba
Total male population 25 to 64 years with postsecondary qualifications	**n/a [4]**	**n/a**	**185**	**7,345**	**155,325**
Education	n/a	n/a	10	590	9,000
Visual and performing arts, and communications technologies	n/a	n/a	0	35	4,150
Humanities	n/a	n/a	0	195	7,470
Social and behavioural sciences and law	n/a	n/a	0	350	10,140
Business, management and public administration	n/a	n/a	10	740	23,490
Physical and life sciences and technologies	n/a	n/a	0	170	5,225
Mathematics, computer and information sciences	n/a	n/a	10	135	7,255
Architecture, engineering, and related technologies	n/a	n/a	135	3,775	62,515
Agriculture, natural resources and conservation	n/a	n/a	0	205	7,785
Health, parks, recreation and fitness	n/a	n/a	0	375	9,435
Personal, protective and transportation services	n/a	n/a	15	775	8,850
Other fields of study	n/a	n/a	0	0	10
Total female population 25 to 64 years with postsecondary qualifications	**n/a**	**n/a**	**160**	**7,940**	**167,930**
Education	n/a	n/a	40	1,555	22,860
Visual and performing arts, and communications technologies	n/a	n/a	10	130	4,495
Humanities	n/a	n/a	0	235	8,335
Social and behavioural sciences and law	n/a	n/a	25	680	18,195
Business, management and public administration	n/a	n/a	35	2,200	41,630
Physical and life sciences and technologies	n/a	n/a	10	130	4,000
Mathematics, computer and information sciences	n/a	n/a	0	245	5,820
Architecture, engineering, and related technologies	n/a	n/a	15	240	4,140
Agriculture, natural resources and conservation	n/a	n/a	0	65	2,640
Health, parks, recreation and fitness	n/a	n/a	15	1,970	46,770
Personal, protective and transportation services	n/a	n/a	15	470	8,995

Table 3-10: Major Field of Study (2006)

Characteristics[1,2]	Split Lake	Fox Lake (Bird)	Gillam	Northern Manitoba Study Area[3]	Manitoba
Other fields of study	n/a	n/a	0	0	30

Source: Statistics Canada 2007.
Notes:
1. Population with postsecondary qualifications by major field of study is based on 20% sample data.
2. Data is rounded using a random rounding procedure, which may result in the reported count having been rounded by 5, or occasionally, 10. Columns may not add due to rounding.
3. The Northern Region is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.

n/a indicates that data are unavailable or suppressed.

3.2.5 Employment Challenges

The Northern Manitoba Economic Development Commission Benchmark Report (1992) noted that, in addition to a lack of employment opportunities, Northern Manitoba First Nations and Northern Affairs communities face certain challenges to labour force participation. Such challenges have recently been noted to include lack of opportunities, lack of training and work experience, perceptions and attitudes of potential employers, language barriers, and cultural differences. In addition, many employment and education opportunities require individuals or family members to leave their home communities. This can lead to stress and anxiety for those who leave and can diminish social networks and resources for families and the home community (Keeyask Hydropower Limited Partnership 2012).

3.2.6 Business

A number of businesses and joint-ventures operate in the SPSA communities. Businesses owned or partly owned by TCN and FLCN that may be able to provide goods and services required by the Project include:

- Tataskweyak Construction Limited Partnership is owned by TCN and located in Split Lake. It provides services to business and government including road building and maintenance, water and sewer, soil remediation, dyke construction, snow removal and house construction.
- Ininew Limited Partnership is jointly owned and operated by TCN and the Mosakahiken Cree Nation. The partnership is located in Winnipeg and provides project management services in civil engineering and architecture.
- Iron North Limited Partnership is a TCN business involved in the purchase and leasing of heavy construction equipment to contractors.
- Tataskweyak Gas Bar is owned by TCN and provides retail gasoline services in Split Lake.
- Amisk Construction is a joint venture between CNP No. 2 Limited Partnership (owned by TCN and War Lake First Nation) and Sigfusson Northern Ltd. The company has provided

services to the Keeyask Infrastructure Project and has the capacity to undertake site preparation and camp maintenance as well as clearing and construction of access roads.

- ESS-Tataskweyak Camp Services is a joint venture between TCN and ESS (part of Compass Group Canada) that provides camp services.
- TC Building Materials Limited Partnership is owned by TCN and is headquartered in Winnipeg. It provides building supplies and building design (architecture, drafting and engineering) and construction services.
- Keeyask Emergency Medical Services is a joint venture between CNP No. 3 Limited Partnership (owned by TCN and War Lake First Nation) and Criticare EMS Inc., formed to provide emergency services at the Keeyask Generation Project construction site.
- Keeyask Maintenance Services is a joint venture between CNP No. 3 Limited Partnership (owned by TCN and War Lake First Nation) and Newton Mechanical Inc., formed to provide camp maintenance services at the Keeyask Generation Project construction camps.
- FLCN has signed a memorandum of understanding with Smook Contractors to provide construction services.
- FLCN has signed a memorandum of understanding with Kleysen Transportation to supply transportation and materials management services. (Keeyask Hydropower Limited Partnership 2012).

Construction service businesses operating in Gillam include Gardon Construction Ltd. and T and E Zelen Construction. Gardewine North provides supplying, shipping and hauling services. Restaurants are available at two motels in the Town. The motels in Gillam report high occupancy rates (Keeyask Hydropower Limited Partnership 2012).

3.3 POPULATION, INFRASTRUCTURE AND SERVICES

This section describes the population, infrastructure and services for communities in the SPSA. TCN and FLCN provide housing, infrastructure and a variety of facilities and services to Members living on-reserve. The Town of Gillam is a base of operations for Manitoba Hydro's northern hydroelectric facilities. Gillam is also the historic and present day home for many FLCN Members and the location of a FLCN reserve. Manitoba Hydro provides housing for its employees and contributes to a range of facilities and services in Gillam. FLCN also provides services for its Members. Thompson is a regional service centre providing some services to residents of communities in the SPSA.

Topics addressed in this section include:

- Population;
- Housing;

- Transportation infrastructure;
- Health and emergency services; and
- Other community services.

3.3.1 Population

Table 3-11 shows the Census population reported by Statistics Canada for communities in the SPSA and Thompson. Figures for the Northern Manitoba Study Area and Manitoba are provided for comparison purposes. Split Lake has the highest population of the communities in the SPSA and showed the largest growth in population between 2001 and 2006 (238 individuals or a 15 per cent increase). Fox Lake (Bird) has the lowest population of the communities in the SPSA and showed a decrease in population between 2001 and 2006 (41 individuals or a 28 per cent decrease). The population in Gillam showed small growth between 2001 and 2006 (31 individuals or a three per cent increase).

Table 3-11: Community Census Populations (2001, 2006)

	2001	2006
Split Lake	1,581	1,819
Fox Lake (Bird)	144	103
Gillam	1,178	1,209
Thompson	13,256	13,446
Northern Manitoba Study Area	82,427	84,600
Manitoba	1,119,583	1,148,401

Source: Statistics Canada 2002 and 2007.

Notes:
The 2001 and 2006 population data consist of 100% of the Census population.
The 2001 and 2006 Census population data is subject to random rounding; population totals and individual cells are rounded.
The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.

Many First Nation communities have Members that live off-reserve due to housing constraints, employment and education opportunities and other factors (Keeyask Hydropower Limited Partnership 2012). In order to understand the size of the TCN and FLCN on-reserve and off-reserve populations, population data from Indian and Northern Affairs Canada were obtained.

Table 3-12 shows the on-reserve and off-reserve population for TCN. Approximately 30 per cent of TCN's Members lived off-reserve in 2001 and 28 per cent lived off-reserve in 2006.
Table 3-13 shows the on-reserve and off-reserve population for FLCN. FLCN has a high percentage of its Members living off-reserve (72 per cent in 2001 and 73 per cent in 2006).

Table 3-12: Tataskweyak Cree Nation On- and Off-Reserve Population (2001, 2006)

	2001	2006
On-Reserve and Crown Land Population	1,857	2,169
% of Total*	70%	72%
Off-Reserve Population	793	851
% of Total*	30%	28%
Total First Nation Population	2,650	3,020

Source: Indian and Northern Affairs (INAC) First Nations Population Profiles 2001 and 2006.

Note:
* Percentage of population On-Reserve, on Crown Land and Off-Reserve calculated by InterGroup Consultants.

Table 3-13: Fox Lake Cree Nation On- and Off-Reserve Population (2001, 2006)

	2001	2006
On-Reserve and Crown Land Population	262	273
% of Total*	28%	27%
Off-Reserve Population	679	746
% of Total*	72%	73%
Total First Nation Population	941	1019

Source: Indian and Northern Affairs (INAC) First Nations Population Profiles 2001 and 2006.

Note:
* Percentage of population On-Reserve, on Crown Land and Off-Reserve calculated by InterGroup Consultants.

3.3.2 Housing

The availability of good quality, affordable housing is an ongoing concern in many Northern Manitoba communities. Housing structure data for communities in the SPSA for 2001 and 2006 are provided in Table 3-14 and Table 3-15. Figures for the Northern Manitoba Study Area and Manitoba are provided for comparison purposes. Information should be interpreted with caution due to the low number of dwellings and the random rounding of data used by Statistics Canada.

Between 2001 and 2006, the number of occupied private dwellings in Split Lake increased by 15 units (4 per cent) compared to a 15 per cent increase in population over the same period. In 2001, approximately 54 per cent of occupied private dwellings in Split Lake were reported as needing major repairs[1]. Limited housing availability, overcrowding and poor housing quality is a concern for TCN's leadership. In 2010 TCN reported a housing waiting list with more than 200 Members (Keeyask Hydropower Limited Partnership 2012).

Between 2001 and 2006, the number of occupied private dwellings reported in Fox Lake (Bird) increased by five units. The availability and quality of existing housing is a concern for FLCN's leadership. In 2009 the Government of Canada transferred 1.29 ha of land in Gillam in the area known as Kettle Crescent to FLCN to create the A Kwis Ki Mahka Reserve. In 2010 FLCN had 27 First Nation-owned housing units on Kettle Crescent (Keeyask Hydropower Limited Partnership 2012).

Between 2001 and 2006, the number of occupied private dwellings in Gillam increased by 25 units (six per cent). The number of occupied private dwellings reported as being in need of major repairs was the same in both 2001 and 2006 (45 units, approximately 10 per cent). A high proportion of occupied private dwellings in Gillam are rented (78 per cent in 2001 and 79 per cent in 2006). Most of these rented homes are owned by Manitoba Hydro and rented to employees stationed in the Town. Manitoba Hydro plans to build a minimum of 200 additional houses in Gillam over the next ten years (Keeyask Hydropower Limited Partnership 2012).

[1] The equivalent figure for 2006 was suppressed.

Table 3-14: Housing Structure Characteristics (2001)

Characteristics[1]	Split Lake	Fox Lake	Gillam	Northern Manitoba Study Area[2]	Manitoba
Total number of occupied private dwellings[3,4]	355	40	405	24,830	432,550
Average number of rooms per dwelling	5.2	5.9	6.8	5.7	6.1
Average number of bedrooms per dwelling	3	3.2	3	2.8	2.6
Owned	0	0	85	10,425	293,295
Rented	40	20	320	6,805	128,930
Band housing[5]	315	20	0	7,595	10,330
Regular maintenance only	60	10	230	9,550	253,215
Minor repairs	95	20	140	9,055	131,450
Major repairs	190	10	45	6,215	47,890
Total number of occupied private dwellings by structural type of dwelling[3,4,6]	355	35	410	24,830	432,550
Single-detached house	310	35	335	18,905	298,230
Semi-detached house	10	0	30	560	12,945
Row house	35	5	5	1,025	13,745
Apartment, detached duplex	0	0	5	170	5,730
Apartment, building that has five or more storeys	0	0	5	300	37,625
Apartment, building that has fewer than five storeys	0	0	15	2,440	55,570
Other single-attached house	0	0	0	65	1,110
Movable dwelling[7]	0	0	15	1,355	7,600

Source: Statistics Canada CD 2001.

Notes:

1. Data is rounded using a random rounding procedure, which may result in the reported count having been rounded by 5, or occasionally, 10. Columns may not add due to rounding.
2. The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.
3. 'Total number of occupied private dwellings' is based on a 20% sample for all Census years, as is information on home rental, home ownership and construction period. Information on dwelling structures, i.e. single detached house, semi-detached house, row house, moveable dwelling and apartment building size is derived from 100% data for all Census years.
4. A private dwelling is an enclosed shelter, protecting the permanent occupant(s) from the elements, with a source of heat or power. The private dwelling must have its' own private entrance or a shared entrance connected directly to the outside or from a common hall, lobby, vestibule or stairway, which does not pass through the occupants' living quarters.
5. "For historical and statutory reasons, shelter occupancy on Indian reserves does not lend itself to the usual classification by standard tenure categories [i.e., "owned" and "rented"]. Therefore, in 1991, a special category, "Band Housing", [was] created for [the] 1991 Census" (Source: 1991 Census Dictionary).
6. Changes to the 'structural type of dwelling' variable have been made across the 1991 and 2001 Census years. In the 2001 Census, duplexes or flats attached to other buildings or dwellings were classified as 'apartment in a building that has fewer than five storeys.'
7. Moveable dwellings include mobile homes and other movable dwellings such as houseboats and railroad cars.

Table 3-15: Housing Structure Characteristics (2006)

Characteristics[1]	Split Lake	Fox Lake	Gillam	Northern Manitoba Study Area[2]	Manitoba
Total number of occupied private dwellings[3,4]	n/a [9]	n/a	435	25,530	448,780
Average number of rooms per dwelling	n/a	n/a	6.7	5.9	6.3
Average number of bedrooms per dwelling	n/a	n/a	3.0	2.9	2.7
Owned	n/a	n/a	90	10,375	309,295
Rented	n/a	n/a	345	6,405	127,900
Band housing[5]	n/a	n/a	0	8,750	11,585
Regular maintenance only	n/a	n/a	285	9,410	267,520
Minor repairs	n/a	n/a	105	8,320	135,220
Major repairs	n/a	n/a	45	7,800	46,035
Total number of occupied private dwellings by structural type of dwelling[3,4,6]	370	40	435	25,520	448,765
Single-detached house	250	35	365	19,020	307,215
Semi-detached house	0	0	50	625	14,045
Row house	10	10	0	1,140	14,085
Apartment, detached duplex	0	0	0	245	6,200
Apartment, building that has five or more storeys	0	0	0	205	37,765
Apartment, building that has fewer than five storeys	0	0	25	2,435	59,835
Other single-attached house	0	0	0	45	790
Movable dwelling[7]	110	0	0	1,815	8,830

Source: Statistics Canada CD 2006.

Notes:

1. Data is rounded using a random rounding procedure, which may result in the reported count having been rounded by 5, or occasionally, 10. Columns may not add due to rounding.
2. The Northern Manitoba Study Area is defined as Statistics Canada Census Divisions 19, 21, 22, and 23.
3. Total number of occupied private dwellings' is based on a 20% sample for all Census years, as is information on home rental, home ownership and construction period. Information on dwelling structures, i.e. single detached house, semi-detached house, row house, moveable dwelling and apartment building size is derived from 100% data for all Census years.
4. A private dwelling is an enclosed shelter, protecting the permanent occupant(s) from the elements, with a source of heat or power. The private dwelling must have its' own private entrance or a shared entrance connected directly to the outside or from a common hall, lobby, vestibule or stairway, which does not pass through the occupants' living quarters.
5. "For historical and statutory reasons, shelter occupancy on Indian reserves does not lend itself to the usual classification by standard tenure categories [i.e., "owned" and "rented"]. Therefore, in 1991, a special category, "Band Housing", [was] created for [the] 1991 Census" (Source: 1991 Census Dictionary).
6. Changes to the 'structural type of dwelling' variable have been made across the 2001 and 2006 Census years. The 2006 Census question was re-worded from 'apartment or flat in a detached duplex' to' apartment or flat in a duplex', so as to include duplexes attached to other buildings or dwellings.
7. Moveable dwellings include mobile homes and other movable dwellings such as houseboats and railroad cars.

n/a indicates that data is unavailable or suppressed.

3.3.3 Transportation Infrastructure

This section describes the major transportation infrastructure in the SPSA. Information on ground transportation (highway and rail) and air transportation is provided.

3.3.3.1 Ground Transportation

PR 280 is a gravel public highway that runs from the intersection with PR 391 immediately north of Thompson to Gillam and Bird. It is the main road connecting the communities of Split Lake, Gillam and Bird and is important to both TCN and FLCN Members. Approximate travel distances between communities in the SPSA are:

- 135 km from Thompson to the Split Lake access road;
- 164 km from Split Lake to the Town of Gillam; and
- 53 km from Gillam to Fox Lake (Bird).

In 2011, the **average annual daily traffic** (AADT) on PR 280 was between 80 and 330 vehicles (MIT 2011). Residents in the area have noted concerns with respect to the poor condition of PR 280 in many sections including damage to vehicles as a result of the poor road conditions.

The transportation technical report completed for the Bipole III Transmission Project environmental impact statement identified that PR 280 northwest of PR 290 had collision rates between 1994 and 2006 ranging from 1.7 million vehicle-kilometres of travel (MVKT) to 2.0 MVKT, which is above the generally accepted value of 1.5 MVKT. The remainder of the corridor is below 1.5 MVKT (MMM Group Ltd. 2011).

Upgrades to PR 280 between Thompson and Gillam have been initiated by Manitoba Infrastructure and Transportation (MIT) in 2012. Planned improvements include widening, smoothing and grading (Government of Manitoba 2009). PR280 is also planned to be rerouted once the Keeyask Generation Project is completed to include the Keeyask Generation Project north access road, the generating station facility over the Nelson River and the south access road to Gillam. FLCN has expressed concern that community Members living in Fox Lake (Bird) will face increased travel distances to Thompson if the northern portion of PR280 around Stephens Lake is decommissioned (Keeyask Hydropower Limited Partnership 2012).

A rail line passes through the SPSA (Map 1-1). The rail line provides both freight and passenger services. A rail station is located on the south side of Gillam. VIA Rail provides passenger service from Gillam to Thompson, Fox Lake (Bird) and Churchill three times weekly.

3.3.3.2 Airports

The Gillam Airport is located on the north side of the town. The runway is 1,524 m in length with a gravel surface. Calm Air provides daily scheduled air service to Gillam from Thompson. Direct flights between Winnipeg and Gillam are available on weekdays and Sunday (Calm Air 2012).

The Thompson Regional Airport and terminal are situated in the Local Government District of Mystery Lake, approximately 5 km northwest of the city. The Thompson airport has daily scheduled service offered by Calm Air and Perimeter airlines and by chartered flights from several other carriers. Calm Air is based out of Thompson and has scheduled service to several locations in Manitoba and Nunavut. The Thompson airport is also the base for Custom Helicopters, Manitoba Government Air (air ambulance), the RCMP Air Division and private contractors.

3.3.4 Health and Emergency Services

This section describes the health care and emergency services available in communities in the SPSA. Subjects reviewed include:

- Fire and ambulance;
- Policing; and
- Healthcare.

3.3.4.1 Fire and Ambulance

Split Lake has a volunteer fire crew of approximately 10 Members, headed by the Fire Chief and a Deputy Chief who are cross-trained as paramedics. The Split Lake fire hall is equipped with a fire truck, water truck and ambulance (Keeyask Hydropower Limited Partnership 2012).

The Gillam fire and ambulance service provides fire protection and emergency medical services to the Town of Gillam and the community of Fox Lake (Bird). The Gillam fire and ambulance service has 20 volunteer firefighters including a chief and deputy chief. The Gillam fire and ambulance service has one pumper truck and two ambulances.

3.3.4.2 Policing

Split Lake has two full-time special constables who have completed training and acquired provincial accreditation, two full-time constables who have not yet acquired provincial accreditation and seven to ten part-time, untrained constables. A Band Constable station was opened in early 2011. The station is equipped with three cells, a dispatch office, waiting room and offices (Keeyask Hydropower Limited Partnership 2012).

The community of Fox Lake (Bird) has one Band constable for community policing. The community also relies on the Gillam RCMP detachment (Keeyask Hydropower Limited Partnership 2012).

The Gillam RCMP detachment has six constables and one administrative assistant. The detachment has two holding cells. Gillam RCMP constables are involved in drug education programming in the community and operate a weekly drop-in youth program (Keeyask Hydropower Limited Partnership 2012).

3.3.4.3 Healthcare

The John Wavey Health Centre opened in Split Lake in 2009. The Health Centre has a dedicated unit for emergency patients, a pharmacy, a kitchen and accommodations for visiting health professionals. The facility has 12 staff including a director, five full-time public health nurses, support staff and a dispatcher who coordinates ambulance transportation. TCN provides a number of health services to its Members in Split Lake including nutritional programs, drug and alcohol programs and home care services (Keeyask Hydropower Limited Partnership 2012).

Fox Lake (Bird) has a community health centre that provides basic health services such as health education, home care nursing and transportation for medical appointments. Residents of Fox Lake (Bird) generally access primary health care services in Gillam. FLCN leadership have identified the need for a new nursing station in Fox Lake (Bird) as part of the 20 year capital plan (Keeyask Hydropower Limited Partnership 2012).

The Gillam Hospital is a ten-bed facility with an emergency department and an x-ray department. The hospital has 32 staff including one physician and ten nurses. The hospital operates a medical clinic and local retail pharmacy. Critical care patients arriving at the Gillam Hospital are flown to either Thompson or Winnipeg (Keeyask Hydropower Limited Partnership 2012).

3.3.5 Other Services

This section describes other services offered in the communities in the SPSA including:

- Utilities;
- Education;
- Childcare; and
- Recreation Services.

3.3.5.1 Utilities

Water and sewer services are available to most, but not all, residences in Split Lake. The water treatment plant in Split Lake was expanded in 2005. Ongoing upgrades to water treatment and water and sewer services in the community are planned. Split Lake receives electrical service from Manitoba Hydro through a substation located approximately 3km from the community. Telephone services are available through MTS. TCN owns Northstream Communications Ltd. which provides high-speed internet service to TCN owned businesses and residences.

The community of Fox Lake (Bird) obtains water from the Nelson River. A water treatment facility was built for the community in 2006. Homes and buildings in the community are served by sewer lines and a mechanical aeration system is used to treat wastewater. Heavy sludge is transported to Gillam. The existing system requires upgrading and at the time of writing, a proposal for an upgrade to the system was being prepared. Electricity is provided by Manitoba Hydro. MTS provides telephone service to the community.

Water for the Town of Gillam is sourced from Stephens Lake and the Kettle River. Gillam has a treated-water reservoir that can store an eight hour supply of water for the community. Piped water and sewer services are available throughout the Town. The water treatment plant has sufficient capacity to serve up to 3,500 residents. The wastewater treatment facility has the capacity to serve approximately 2,500 residents. Manitoba Hydro provides electricity service to the community. Telephone service is provided by MTS.

3.3.5.2 Education

In Split Lake, the Tataskweyak Education Authority is responsible for delivering the kindergarten to grade 12 education programs in the community. The Chief Sam Cooke Mahmuwee Education Centre provides education from kindergarten through high school. The school was designed for a capacity of 500 students but is frequently overcapacity. The school has 30 full-time teachers, 20 full-time teaching assistants and 15 support staff. A University College of the North Regional Centre is located 5 km outside the community. The Centre offers construction and trades training programs, recreation leadership training and other programs (Keeyask Hydropower Limited Partnership 2012).

The Fox Lake School provides education services for kindergarten through grade eight to residents of Fox Lake (Bird). The school has three classrooms, a computer room, a library, a gymnasium and living space for teachers. The school has 8 full-time teaching staff and two administrative staff. After grade eight, students must travel to Gillam or other communities to continue their education (Keeyask Hydropower Limited Partnership 2012).

The Gillam School provides education services for kindergarten through grade 12. In 2009 the school had approximately 335 students enrolled with an additional 50 adult education students.

High school enrolment has been noted to be increasing recently. The Gillam School has 54 staff members including 32 teachers.

3.3.5.3 Childcare

The TCN Headstart/Day Care Centre provides child care, early childhood education and basic health care to approximately 30 children in Split Lake. The Centre has a director and six full-time employees. The Centre generally has a waiting list. The limited availability of childcare in the community has been noted as a challenge for parents who wish to pursue local employment opportunities (Keeyask Hydropower Limited Partnership 2012).

There is no current daycare program operating in Fox Lake (Bird). A previous day care at the Fox Lake School was closed in 2008 due to lack of funding. FLCN is currently examining options to provide daycare services to Members in Fox Lake (Bird) and Gillam (Keeyask Hydropower Limited Partnership 2012).

The Gillam Pre-School Co-op Daycare offers preschool services as well as day care for pre-school and after school care for school-aged children. The day care has a capacity of 40 children, but generally cannot operate at capacity due to staffing challenges and a lack of space. There is generally a waiting list for the daycare. A new childcare centre is under construction and expected to be completed in 2012 with a capacity for 75 children (Keeyask Hydropower Limited Partnership 2012).

3.3.5.4 Recreation Services

The TMC Arena in Split Lake is a multi-purpose facility that houses a hockey rink, fitness area, volleyball courts and a canteen. The arena has a full-time manager and two-full time maintenance workers. The Tataskweyak Education Authority provides extra-curricular activities for children and youth including after-school sports, art, music and woodworking programs (Keeyask Hydropower Limited Partnership 2012).

Recreation activities in Fox Lake (Bird) often occur at the school in the community. Treaty Days, sports nights and community feasts are held at the school throughout the year. Residents of Fox Lake (Bird) also access recreation facilities in Gillam (Keeyask Hydropower Limited Partnership 2012).

The Gillam Recreation Centre is a multi-use facility that includes an arena, curling rink, meeting room space, gymnasium and bowling alley. The Nelson River Aquatic Centre opened in 2005 with a swimming pool and a water slide. Other recreational facilities in Gillam include a driving range, baseball diamonds and soccer fields.

3.4 PERSONAL, FAMILY AND COMMUNITY LIFE

Personal, family and community life play a central role in the quality of life experienced by people and communities. This section describes the following aspects of personal, family and community life for communities in the SPSA:

- Governance;
- Workplace health and safety;
- Community health;
- Public safety and worker interactions;
- Aesthetics (the Way the Landscape Looks); and
- Culture and spirituality.

3.4.1 Governance

TCN is governed by a Chief and six Councillors elected under Section 74 of the Indian Act. A custom election code has been developed and is pending ratification by community vote prior to formal submission to the federal government. The Chief and Councillors serve two-year terms. Chief and Council are mandated to provide leadership, guidance, service and accountability to TCN Members on- and off-reserve. Each Councillor is usually responsible for a portfolio and between six to eight departments (Keeyask Hydropower Limited Partnership 2012).

FLCN is governed by a Chief and three Councillors elected under a custom electoral system. Chiefs and Councillors do not have set terms in office. Councillors are responsible for portfolios including education, training and employment; health; housing; operations and maintenance; economic development; justice and emergency services (Keeyask Hydropower Limited Partnership 2012).

The Town of Gillam is governed by a Mayor and four Councillors who are elected to four-year terms. Following the creation of the A Kwis Ki Mahka reserve, FLCN and the Town of Gillam entered into a municipal services agreement. The agreement identifies facilities and services subject to cost sharing, as well as processes that must be adhered to for future land use changes (Keeyask Hydropower Limited Partnership 2012).

3.4.2 Workplace Health and Safety

Workplace safety and health for Manitoba Hydro and contractors is a top priority at all times during a project. Hazards in the workplace can be caused by the unsafe use of materials, tools, machinery and chemicals, and can be exacerbated by literacy or language barriers (Workers

Compensation Board of Manitoba 2008). Manitoba Hydro's safety systems and services provide prevention by minimizing risks to people, property, and the environment. The policies and programs in place to support employee health and safety include the following:

- Safety, health, and workplace policies and programs;
- Technical expertise and assistance to support employee activities in safety and health;
- Discrimination and harassment free workplace policies;
- Health education programs;
- Personal and confidential health counselling;
- Employee assistance programs; and
- Construction camp policies and rules.

All Manitoba Hydro employees and contractors are required to follow *The Workplace Safety and Health Act* and associated regulations dealing with the health and safety of workers, protection of the public from unsafe mechanical and electrical equipment and fuel-burning appliances in buildings, and the licensing of tradespersons in the province. The Manitoba Workplace Health and Safety Division emphasizes a preventive focus to eliminate workplace and public hazards through education, training, working with employers and employees, and inspections and incident assessments.

3.4.3 Public Safety and Worker Interaction

Public safety refers to the overall prevention and protection of people from issues that affect their personal and collective security. It also involves individual and community perceptions of safety.

TCN operates the Ooskahtisuk Club Project which is designed to reduce substance abuse and youth crime in the community. TCN's band constables work closely with the Thompson RCMP detachment to respond to public safety concerns in the community (Keeyask Hydropower Limited Partnership 2012).

The FLCN Band constable is primarily responsible for policing related to public safety concerns in Fox Lake (Bird). The Band constable also works with the Gillam RCMP detachment (Keeyask Hydropower Limited Partnership 2012).

The Gillam RCMP detachment is responsible for policing in Gillam. The Gillam RCMP are involved in several public safety programs in Gillam and Fox Lake (Bird) including drug education and restorative justice programs (Keeyask Hydropower Limited Partnership 2012).

The communities in the SPSA have experienced the development of multiple hydroelectric and other northern development projects. Past experiences have resulted in fears and concerns about the potential for negative interactions between SPSA community residents and non-local workers. Issues identified by communities in the SPSA related to worker interactions include harassment and racism, alcohol and drug use, physical abuse, violence, infidelity, pregnancy and paternal abandonments. These incidents have affected not only the individuals who directly experienced them, but also their families, friends and broader community (Keeyask Hydropower Limited Partnership 2012).

FLCN in particular has a long history of interaction with hydro development construction workers, beginning with the development of the Kettle Generating Station in the 1950s. In recent years, Members of FLCN have spoken candidly of their past experiences with hydroelectric development. FLCN has reported that interaction incidents during past hydroelectric projects have left psychological and emotional scars that have lasted many years and in some cases throughout a lifetime. The consequences have been noted to affect not only the victims of these incidents, but also their families and friends (Keeyask Hydropower Limited Partnership 2012).

3.4.4 Community Health

Community health is influenced by a wide variety of factors. Drinking water quality, food choices, behaviours such as smoking and physical activity and air quality all affect health. Socio-economic indicators reviewed in the previous sections of this report such as housing, income and education are also determinants of overall community health. Measuring determinants of health is challenging due to the breadth of factors that can contribute to health and the availability of health indicator data.

Mino-pimatisiwin (living a good an honourable life) is a key concept in Cree perspectives on community health. *Mino-pimatisiwin* includes being a good person, harvesting and consuming healthy foods and following Cree values. Adleson (2000) notes that from a Cree perspective “health has as much to do with social relations, land and cultural identity as it does with individual physiology.” For TCN and FLCN Members, changes in the ability to engage in cultural practices lead to changes in community health.

3.4.5 Aesthetics (the Way the Landscape Looks)

The area in proximity to the Project features gently sloping terrain with lakes of various sizes scattered across the landscape. Bogs and peatlands occur through much of the area. The area is also characterized by the presence of discontinuous permafrost (Keeyask Hydropower Limited Partnership 2012).

First Nations perspectives on the aesthetic value of the area relates to their understanding of their environment. TCN and FLCN’s traditions are rooted in a relationship with the land, and

each of the communities recount stories about how their existence is intertwined with the rivers and lakes. The existing landscape is markedly different than the landscape their ancestors knew and has witnessed substantial changes through the development of major infrastructure projects such as the Hudson Bay Railway, road development and hydroelectric development (including generating stations, transmission lines and converter stations). First Nations communities in the region note the area is considered by them to be an altered environment, not a pristine environment (Keeyask Hydropower Limited Partnership 2012).

The appearance of the town of Gillam has changed over time as the community evolved. Long-term residents in the community have noted recent improvements to the town's appearance through efforts by the town's beautification committee. Others have noted derelict buildings and facilities in need of updating. FLCN's visual presence in the community is increasing through the introduction of new buildings and signage (Keeyask Hydropower Limited Partnership 2012).

3.4.6 Culture and Spirituality

TCN and FLCN each have a unique set of historical experiences that has shaped their individual communities. However, there are common cultural and spiritual elements. Both TCN and FLCN self-identify as Cree, speak the Cree language and acknowledge roots to York Factory coastal Cree (Keeyask Hydropower Limited Partnership 2012).

Engaging in traditional cultural practices and retaining and transmitting ATK are core aspects of cultural identify for TCN and FLCN. Culture and spirituality are influenced by a relationship with their surrounding environment and the Cree worldview indicates that everything is alive, is interconnected and needs to be respected. The Cree view themselves as important stewards of the land, water and living things. TCN state that, "The customs, practices and traditions that are integral to our distinctive cultural identity, and that are reflected in our social organizations, are rooted in our relationships with Mother Earth" (TCN 2011). TCN also notes "Our culture, built around hunting, fishing and gathering, possesses knowledge accumulated over generations about how the non-human beings of Mother Earth interrelate with each other (TCN 2011). FLCN describe cultural practices and ATK as fundamental means of cultural expression and transmission (Keeyask Hydropower Limited Partnership 2012).

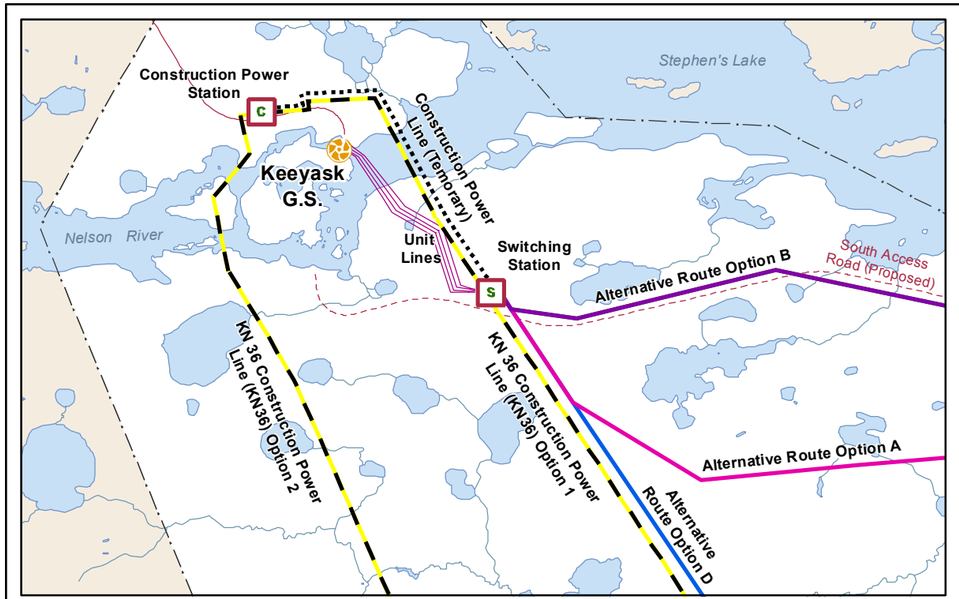
Kinship is also an important element of culture and spirituality for TCN and FLCN. First Nation communities are often structured around social networks, kinship relationships and functional roles within a community. These roles and relationships are not limited to families and child rearing but are community wide and intertwined into all aspects of daily life, including sharing of resources and providing services.

TCN describes the importance of these relationships, stating:

> Perhaps the most fundamental attribute of social relationships amongst our people is the imperative of sharing because traditionally, one did not acquire possessions beyond personal requirements except for the purpose of sharing with others (TCN 2011).

Language has a critical role for TCN and FLCN in supporting and preserving Cree culture and spirituality. Language, in this case speaking and/or understanding Cree, is an integral aspect in articulating the traditional cultural practices and ATK with the present generation. Changes to the use of language and its role in culture have been influenced by residential schools and the emergence of modern communication technologies (Keeyask Hydropower Limited Partnership 2012).

These identified elements of culture and spirituality are fundamental to life for TCN and FLCN. The value placed on cultural knowledge and practices and the Cree language strengthen social-capital, personal and community well-being and resilience to change.



Keeyask Transmission Project

Project Infrastructure

- Route Alternative Option A
- Route Alternative Option B
- Route Alternative Option C
- Route Alternative Option D
- Construction Power Line (KN36) Option 1 and 2
- Construction Power Line (Temporary)
- Unit Lines
- Construction Power Station
- Switching Station
- Study Area

Infrastructure

- Converter Station
- Generating Station (Proposed)
- Generating Station
- Bipole I and II (Existing 500 kV DC Line)
- Transmission Line
- South Access Road (Proposed)
- Access Road

Mining

- Quarry Leases
- Mineral Exploration Licenses

Landbase

- Community
- Provincial Road
- Active Railway
- Abandoned Railway
- Registered Trapline
- First Nation
- Watercourse
- Waterbody

Coordinate System: UTM Zone 15N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: September 26, 2012

N

0 4 8 Kilometres
0 4 8 Miles

1:400,000

Resource Use

Map 3-1

4.0 EVALUATION OF ALTERNATIVE ROUTES AND OTHER INFRASTRUCTURE

4.1 DESCRIPTION AND EVALUATION OF ALTERNATIVE PROPOSED ROUTES AND OTHER INFRASTRUCTURE

This section provides a description and initial evaluation of proposed transmission routes and locations for other Project infrastructure. The following components are reviewed:

- Construction power transmission line and station;
- Unit transmission lines;
- Keeyask Switching Station;
- Generation Outlet Transmission lines; and
- Radisson Converter Station upgrade.

The alternative sites for each of the Project components were reviewed from a socio-economic perspective. Construction workforce requirements and potential employee complements are expected to be similar, regardless of which preferred routes or site options are selected. As a result, the potential effects of the project on the population, infrastructure and services and economy VECs are not expected to vary between the alternatives. Therefore the evaluation of alternatives from a socio-economic perspective focused on the land and resource use and personal, family and community life VECs.

Each of the proposed sites was reviewed, considering potential relative effects on land and resource use and personal, family and community life. Preferences and perspectives expressed by community members in TCN's evaluation report, during workshops with FLCN and during the public involvement program were considered as part of this evaluation. Where there was reason to prefer one alternative site or route option over others from a socio-economic perspective, this preference was noted and included as an input to the overall selection of preferred site and route options (Chapter 6 of the Environmental Assessment Report).

4.1.1 Construction Power Line and Station

This section provides a description and initial evaluation of the construction power transmission line and station.

4.1.1.1 Construction Power Line

Two routes were initially considered for the Construction Power Transmission (Map 4-1) line. Environmental and heritage studies indicated a preference for alternative route #1 due to the fewer number of water crossings and the shorter transmission line distance. Alternative route #1 is preferred from a socio-economic land and resource use perspective for similar reasons.

TCN was presented only alternative route #1 and therefore comments on the Construction Power line during interviews with their Members were generally limited (TCN 2011).

4.1.1.2 Construction Power Station

The Construction Power **transformer station** is required to be located on the north side of the Nelson River near the Keeyask Generation Station site. Five potential sites were considered. Four of these sites were identified as conflicting with the provincial road realignment. Therefore the remaining site is the preferred site from a socio-economic environment perspective (Map 4-1).

4.1.2 Unit Transmission Lines

Four 138-kV AC Unit Transmission lines will transmit power from each generator located at the Keeyask Generation Station to the Keeyask Switching Station. The four lines, approximately 4 km long, will be located in a single corridor. The location of the unit transmission lines is determined as a result of the location of the Keeyask Generation Station and the Keeyask Switching Station. There are no socio-economic concerns that would require a revised alignment of the Unit Transmission Lines.

4.1.3 Generation Outlet Transmission Lines

This section provides a description and initial evaluation of the Generation Outlet Transmission lines and facilities.

4.1.3.1 Generation Outlet Transmission Lines and Facilities

Four alternative routes were considered for the Generation Outlet Transmission lines (Map 4-1). Route D was added as an alternative route at the request of FLCN. The construction workforce requirements are expected to be similar for each alternative. As a result, potential effects to the population, infrastructure and services and economy VECs are not expected to vary between the alternatives. Therefore the evaluation of alternatives focused on the land and resource use and personal, family and community life VECs.

TCN has noted a preference for route alternative B as the best compromise of the three routes. TCN notes route B is the route closest in proximity to the existing KN36 and R26K transmission

lines and the future south access road for the Keeyask Generation Station. TCN recommended that Route B should be modified so that it remains on the south side of the access road until it intersects the Construction Power line (TCN 2011). This alignment is shown for Route B in Map 4-1. FLCN has noted a preference for Route D.

Route B, with the modification recommended by TCN, is a suitable route option from a socio-economic perspective. Route B is close to the future south access road and therefore would minimize additional disturbance to resource use areas. Route B, as modified, would be expected to minimize potential effects to land and resource use and personal, family and community life.

Routes C and D also minimize additional disturbance to resource use areas by following to a large extent rights-of-way of existing or planned infrastructure. Therefore, these route options are also considered suitable from a socio-economic perspective.

Route A is the least preferred route option from a socio-economic perspective. This route option would create the greatest additional disturbance to resource use areas and fragmentation of culturally important landscapes.

4.1.3.2 Keeyask Switching Station

The 138-kV Keeyask Switching Station provides the terminal and related facilities needed to establish the connection to the four 138-kV unit lines and the three 138-kV transmission lines to the Radisson Converter Station. Seven alternative station sites were initially identified. Three sites on the north side of the Nelson River were eliminated from consideration because of the requirement for longer transmission lines and river crossings. Site 1 on the south side of the Nelson was eliminated from consideration as the site is in the flood area of the proposed Keeyask Generation Project. Site 2 is located in a rock quarry and therefore not suitable. Site 3 is the preferred site with site 4 as an alternative. Manitoba Hydro proposes to acquire both sites to allow for future expansion. No socio-economic concerns were identified that would prevent the use of either site for the Keeyask Switching Station.

4.1.3.3 Radisson Converter Station Upgrade

The modifications required as part of the Radisson Converter Station upgrade will be contained within the existing station fence line and use the existing foundation and oil containment infrastructure. The Radisson Converter Station footprint is located in an area of existing development and therefore there are no site selection concerns from a socio-economic perspective.

Manitoba Hydro

Keeyask Transmission Project

Project Infrastructure

- Route Alternative Option A
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- Route Alternative Option C
- Route Alternative Option D
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- Transmission Line
- South Access Road (Proposed)
- Access Road

Landbase

- Community
- Provincial Road
- Municipal Road
- Active Railway
- Abandoned Railway
- Watercourse
- Waterbody

Coordinate System: UTM Zone 15N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: September 21, 2012

N

0 2 4 Kilometres
0 2 4 Miles

1:150,000

Project Infrastructure

Alternative Transmission Line Routes

Map 4-1

5.0 EFFECTS AND MITIGATION

This section considers potential effects of the project based on the final preferred sites for each project component. The selection process that resulted in the final preferred sites is described in Chapter 6 of the Environmental Assessment Report. Mitigation and enhancement options are described. Potential interactions with other future projects are also reviewed.

5.1 POTENTIAL ENVIRONMENTAL EFFECTS

Potential environmental effects were identified based on the project description, review of available literature, experience with other linear projects in Northern Manitoba and information provided by communities in the socio-economic SPSA. Potential effects of the project are reviewed for each of the socio-economic environment VECs (land and resource use; population, infrastructure and services; economy and personal, family and community life.

5.1.1 Land and Resource Use

This section reviews potential pathways of effect to components of land and resource use.

5.1.1.1 Domestic Resource Use

The Project will affect domestic resource use in the in SPSA during construction and for the life of the Project. In particular:

- The Generation Outlet Transmission lines will create an additional approximately 200 m wide corridor over the approximately 38 km length of the lines.
- The Construction Power line will create an approximately 22 km corridor between KN36 and the Construction Power Station.

Other elements of the Project have smaller footprints and therefore smaller effects on domestic resource use.

The clearing and maintenance of areas for Project infrastructure will affect habitat in the SPSA. This will change the use of areas directly in the Project footprint and may lead to increased pressures on resource use activities in areas out of the project footprint area. TCN's evaluation report notes issues related to the Project include the loss of traditional plants and berries, adverse effects to subsistence activities such as trapping and hunting and diminished opportunities to pursue a traditional lifestyle (TCN 2011).

Access created by the existence of the right-of-ways for the Construction Power line and the Generation Outlet Transmission lines will have effects on the pursuit of domestic resource use.

During both construction and operation, the right-of-way may allow access by individuals who would not previously have used the area. This effect may be considered positive in some respects (by allowing increased access to domestic resource users to some areas) and negative in other respects (by improving accessibility to resource users or recreational users).

5.1.1.2 Commercial Resource Use

The Project will affect commercial trapping activities in the SPSA during construction and for the life of the Project. In particular:

- The Generation Outlet Transmission lines will create an additional approximately 200 m wide corridor over the approximately 38 km length of the lines. This corridor will cross portions of traplines 65 and 9.
- The Construction Power line will create an approximately 22 km corridor between KN36 and the Construction Power Station. This corridor will cross portions of traplines 7, 8, 9 and 15.

In addition, the Construction Power Station is located in a portion of trapline 15.

Access created by the existence of the right-of-ways for the Construction Power line and the Generation Outlet Transmission lines will have effects on the pursuit of commercial resource use. During both construction and operation, the right-of-way may allow access by individuals who would not previously have used the area. This effect may be considered positive in some respects (by allowing increased access to commercial trappers to some areas) and negative in other respects (by improving accessibility to resource users or recreational users).

Potential effects to commercial forestry resources are addressed in the forestry technical report. The Project is not expected to have effects on mining.

5.1.1.3 Outdoor Recreation

Access to some trails and travel routes currently used for recreation may be disturbed or interrupted during the construction period. These effects are related generally to construction and transportation for all components of the Project and are not specific to any one component.

The preferred routes for the Generation Outlet Transmission lines have been sited adjacent to existing or planned developments wherever possible. Therefore effects during the operations phase are expected to be limited.

5.1.2 Economy

This section reviews potential pathways of effect to components of economy.

5.1.2.1 Direct Employment, Income and Business Opportunities

Workforce requirements during construction are expected to be cyclical and seasonal in nature. Transmission line work is expected to be concentrated in the winter months and therefore employment opportunities are generally expected to be short-term in nature. Table 5-1 summarizes the preliminary average workforce estimates by quarter for the Project. These estimates could change when the Project is implemented depending on how the contractors choose to perform the work.

Table 5-1: Preliminary Estimated Peak Workforce Estimates by Quarter

Fiscal Year Ending	Q1	Q2	Q3	Q4
2014	0	0	100	200
2015	200	100	0	0
2016	0	0	0	200
2017	200	25	25	200
2018	200	25	25	200
2019	200	0	0	0

*Estimated average workforce by quarter. These estimates could change when the Project is implemented depending on how the contractors choose to perform the work.

The major transmission activities involving potential local workforce opportunities relate to non-designated trades such as labourers and equipment operators required for rights-of-way clearing. There may be some local workforce employment opportunities associated with the site preparation of the temporary Construction Power Station and Keeyask Switching Station, though much of this work will involve specialized skilled labour requirements.

The Joint Keeyask Development Agreement (JKDA) designates the Construction Power sub-station clearing and the Construction Power right-of-way clearing as direct-negotiation contracts for the **Cree Nation Partners** (CNP)[1] (CNP, YFFN, FLCN and the Manitoba Hydro-Electric Board 2009).

Workforce requirements during the operations phase are expected to be small. On average, annual workforce requirements are expected to be approximately 11.5 person-years. Two or three of these positions would be internal Manitoba Hydro staff with the remaining positions being contractors engaged on an as-required basis. Employment effects are therefore expected to be small during the operations period.

[1] IC-2 and IC-4 in Schedule 13-1 of the JKDA address the clearing contracts for the Construction Power right-of-way and the Construction Power sub-station. IC-4 notes this contract is subject to MH Transmission and Distribution review.

5.1.2.2 Regional Supplies and Services

The Project will increase demand for supplies and services during the construction phase in the regional service area, primarily Gillam and Thompson. Sectors most likely to experience effects include construction equipment and material suppliers; restaurant and hospitality; transportation; and recreation services. This effect may be perceived as positive by businesses with unused or under-utilized capacity or adverse by businesses or users or businesses that experience constraints on capacity. On balance, however, the net effect is expected to be positive.

During the operations phase, the Project is not anticipated to have a noticeable effect on the demand for regional supplies and services.

5.1.3 Population, Infrastructure and Services

This section reviews potential pathways of effect to components of population, infrastructure and services.

5.1.3.1 Population and Housing

The Project is not expected to noticeably affect the population or housing requirements of the communities in the SPSA. Project construction employment opportunities are anticipated to be largely seasonal (concentrated in the winter months) and temporary. Construction work camps will be developed to provide temporary accommodations for workers during the construction period. Therefore, Project construction employment does not provide a strong incentive for workers to relocate permanently to the area.

On average during the operation phase, the Project is anticipated to provide employment for 11.5 persons annually. Of these, two or three positions are expected to Manitoba Hydro internal staff with the remainder being contractor staff engaged on an as-required basis. Line inspections could involve concurrent inspections of several transmission lines in the area. Maintenance activities would take place on an as-required basis. Therefore the Project is not anticipated to create substantial permanent employment during the operations period and is not expected to result in noticeable effects on population or housing requirements in the SPSA.

5.1.3.2 Traffic and Transportation Infrastructure

The Project is expected to increase traffic volumes during the construction phase, particularly in the vicinity of Gillam and on PR 280 between Gillam and Thompson. Transportation requirements for the Project are expected to include the transportation of equipment (bulldozers, excavators, drum rollers/compactors, graders, cranes, scissor lifts and concrete trucks) and materials (granular material, rebar and concrete). Materials and equipment may be transported by low bed or flat bed. Upgrades to PR 280 between Thompson and Gillam have been initiated by the Province of Manitoba as part of its 2012 infrastructure projects. The upgrades include

widening and curve shaving. By the time Project construction begins, the upgrades are intended to meet a standard that will improve safety and accommodate increased traffic (Keeyask Hydropower Limited Partnership 2012).

There may also be increased air and rail transportation as a result of the Project. The railway running through Gillam has not experienced capacity issues in the past. Special trains have been put into service in the past for large freight requirements for northern hydro-electric development (Keeyask Hydropower Limited Partnership 2012). It is anticipated similar services can be implemented for the Project if required.

No discernible effects on traffic are expected during the operation phase of the Project.

5.1.3.3 Health and Emergency Services

The presence of a temporary workforce may increase demands on health care and emergency services during the construction phase. It is anticipated Gillam would be the primary community providing health and emergency services in the event these services are required. At present the Gillam Hospital adequately meets the needs of the population (Keeyask Hydropower Limited Partnership 2012). The relatively small, temporary nature of the construction workforce is not anticipated to result in material additional requirements for health and emergency services.

Workforce requirements during the operations phase are small and therefore no discernible effects on health and emergency services are anticipated during the operations phase.

5.1.3.4 Other Community Services

The majority of construction workers are anticipated to be accommodated in work camps near Gillam. These camps will not have substantial recreational amenities. Therefore the presence of a temporary workforce may increase demands on community services, particularly in Gillam, including recreation and leisure services during the construction phase. It will be important for Manitoba Hydro to continue to maintain communication and provide information to local service providers and the Town of Gillam throughout the construction period in order to assist them in planning service provision and to identify any potential problems with community service levels.

Workforce requirements during the operations phase are small and therefore no discernible effects on other community services are anticipated during the operations phase.

5.1.4 Personal, Family and Community Life

This section reviews potential pathways of effect to components of personal, family and community life.

5.1.4.1 Workplace Health and Safety

During the construction phase, there may be effects to worker health and safety from accidents. Safety and accident prevention measures will be in place during the construction period. Exposure to drug and alcohol use at the construction camp and increased stress and anxiety for workers in new environments and away from families and home communities may also be experienced during the Project's construction phase.

The average annual workforce requirement during the operations phase is expected to be small (approximately 11.5 persons on average). Workplace health and safety regulations and Manitoba Hydro's safe work practices will be observed. Therefore no discernible effects on workplace health and safety are anticipated during the Project's operations phase.

5.1.4.2 Health and Safety of Area Residents and Resource Users

During the construction phase, there may be effects on health and safety of area residents and resource users due to the presence of equipment and construction activities. Where access is a concern to communities, Manitoba Hydro will work with directly affected communities to prepare Access Management Plans prior to construction.

During the operations phase, the presence of the Construction Power line and the Generation Outlet Transmission lines may lead to effects on the health and safety of area residents and resource users. Accidents related to collisions with project infrastructure are possible. Site security for the Construction Power Station, Keeyask Switching Station and Radisson **Convertor Station** will include perimeter fencing to limit access to the sites and reduce the potential for accidents involving area residents and resource users. Guy wire shields can be used to improve the visibility of guy wires to resource users and others traveling in the area.

5.1.4.3 Electro-magnetic Fields

Adverse effects to health during the operating phase related to electro-magnetic fields (EMF) are not anticipated. Magnetic fields and electric fields outside the right-of-way are expected to be below limits recommended by provincial, national and international agencies. However, Manitoba Hydro is sensitive to public concerns regarding potential health effects and EMF and continues to undertake the following actions regarding the issue:

- Monitoring of worldwide research programs on EMF;
- Participation in and support of on-going health and safety research on local, national and international levels; and

- Maintenance of active communications and provision of technical information to interested parties, including the public and agencies responsible for public and occupational health and the environment.

In addition, Manitoba Hydro continues to conduct measurements of magnetic fields levels for the public on request. Additional information on Manitoba Hydro's approach to addressing issues related to electro-magnetic fields can be found in Section 8.3.5.3 of the Environmental Impact Statement for the Bipole III Transmission Project (Manitoba Hydro 2011).

5.1.4.4 Public Safety and Worker Interactions

The construction workforce is expected to be housed in temporary work camps close to Gillam. The limited recreation and leisure options that will be available at the construction work camp sites are likely to result in construction workers seeking out recreation and leisure options in Gillam. This leads to concerns about the potential for harmful interactions between workers and vulnerable community members. The potential for these interactions also leads to broad concerns about adverse effects on general public safety in the community. Adverse effects on public safety, both perceived and realized, can change how community members feel about the community, leading to effects on community cohesion and well-being.

FLCN and TCN's past experience with hydroelectric projects indicate that an influx of non-local workers can result in a broad array of adverse effects on public safety for those residing in communities close to these developments. Effects noted during past projects include racism, increased alcohol and drug abuse, assaults and other violent crimes and inappropriate sexual behaviour between construction workers and community Members in the SPSA, including risks related to sexually transmitted infections (Keeyask Hydropower Limited Partnership 2012). FLCN and TCN are concerned about the potential for similar effects as a result of the Project.

5.1.4.5 Culture and Spirituality

TCN's evaluation report notes concerns with respect to effects of the Project on their culture and spirituality in particular as an extension of effects to traditional land and resource use. TCN's evaluation report states:

> All beings, including inanimate ones such as rocks and trees, have spirits that give them life and maintaining proper relationships with the spirits of all other beings is an essential part of our way of living. During the construction of the KTP, we acknowledge that vast areas of land will be cleared and rocks, plants, trees and other life forms will be removed or destroyed. This activity will be a source of great spiritual distress for our people as we continually seek to maintain a healthy, respectful relationship between people and all living things (TCN 2011).

Effects to domestic resource use (described in Section 5.1.1.1) are also expected to lead to effects to culture and spirituality. Both TCN and FLCN view the ability to engage in domestic resource use activities as a fundamental means of cultural expression and transmission. Therefore adverse effects to domestic resource use are also expected to lead to adverse effects on culture and spirituality for TCN and FLCN.

5.1.4.6 Physical Changes to the Landscape

The Project will create permanent changes to the landscape and aesthetics due to the presence of project infrastructure. Preferences have been noted by some residents of communities in the SPSA to locate project infrastructure in areas of existing disturbance wherever possible to minimize these effects.

5.2 MITIGATION AND ENHANCEMENT MEASURES

A site selection process was undertaken and preferred sites for the Project components were designed to minimize effects and disruption to the socio-economic environment. Additional mitigation and enhancement measures are described below.

5.2.1 Land and Resource Use

The preferred routes and sites for Project infrastructure were selected to minimize potential effects on land and resource use. Access created by the existence of the right-of-way will have effects on the pursuit of domestic resource use and recreational resource users. The right-of-way may allow access areas by individuals who would not previously have used the area. Where access is a concern to communities, Manitoba Hydro will work with directly affected communities to prepare Access Management Plans prior to construction.

The preferred route for the Generation Outlet Transmission lines has been chosen to minimize the creation of new access points. This mitigates the degree to which the Project creates new effects on access to resource use areas.

Registered trapline holders whose commercial trapping operations are affected by the Project will be compensated consistent with Manitoba Hydro's Trapper Notification and Compensation Policy for New Transmission Development. Compensation may include trap line improvements, employment opportunities, equipment replacement or monetary settlement.

5.2.2 Economy

For work packages filled through direct-negotiation contracts[1], the ability to direct hire maximizes the likelihood of qualified Aboriginal residents being hired for a Project related job before someone else is hired.

For positions on competitively bid contracts, an Aboriginal and local hiring preference is expected to be included in the tender calls, consistent with other Manitoba Hydro construction projects in Northern Manitoba. The employment preference for Aboriginal and local residents is expected to be implemented for candidates who meet the necessary training, experience and other qualifications.

Participation in Project employment opportunities will be influenced by how interested and willing local residents are to pursue jobs. Job seekers may be motivated by the opportunity to earn substantial income and to improve their future employment prospects. Some local residents may be deterred by having to work in unfamiliar conditions, by lack of support structures such as child care or by concerns about experiencing discrimination.

Businesses from First Nations and other northern Manitoba communities could have the opportunity to secure contracting opportunities made available under the terms of Manitoba Hydro's Northern Purchasing Policy. The policy is designed to guide procurement actions aimed at promoting business opportunities for Northern Aboriginal, Northern and Manitoba businesses on northern works within the Northern Affairs Boundary.

The effect of demands on businesses and services, particularly in Gillam, can be mitigated by maintaining communication between Manitoba Hydro and the community. Providing ongoing information about construction activities and timing can allow for planning related to business service levels and can help to identify and address constraints and concerns as they arise.

5.2.3 Population, Infrastructure and Services

During the project construction and operation workers will be encouraged to observe safe driving practices to minimize the potential for accidents. Construction workers will also be expected to adhere to provincial workplace health and safety legislation and Manitoba Hydro's safe construction policies.

The effect of demands on community services, particularly in Gillam, can be mitigated by maintaining communication between Manitoba Hydro, the community and local service providers such as health authorities and the RCMP. Providing ongoing information about construction activities and timing can allow for planning related to community service levels and

[1] The JKDA designates the construction power sub-station clearing and the construction power right-of-way clearing as direct-negotiation contracts for the Cree Nation Partners.

can help to identify and address constraints and concerns as they arise. The Town's Mayor, Council and Chief Administrative Officer, along with Manitoba Hydro and leadership of FLCN will need to maintain strong communication on construction-related activities and mitigation measures. These groups are already involved in a community land use planning process as well as the Harmonized Gillam Development process (Keeyask Hydropower Limited Partnership 2012).

5.2.4 Personal, Family and Community Life

Worker safety is highly regulated under provincial legislation. Adherence to provincial workplace health and safety legislation and regulations, Manitoba Hydro's safe construction practice policies and camp safety and security measures can mitigate potential adverse effects to worker health and safety. An Environmental Protection Plan (EnvPP) will also be in place during the Project construction period. Adherence to the EnvPP will help mitigate potential workplace health effects.

Appropriate signage, fencing and construction site management will help reduce the potential for accidents involving local residents or resource users who normally access areas affected by Project construction. Guy wire shields will help improve the visibility of guy wires to resource users and others who travel through the Project area.

Due to the concerns of FLCN and TCN related to public safety and worker interaction, a suite of mitigation measures were developed. A workshop was held in Gillam with FLCN Members in 2010 to examine the nature and extent of worker interaction incidents during construction and to identify what could be done to mitigate worker interaction effects. While the workshop was conducted in relation to the Keeyask Generation Project environmental assessment, mitigation measures identified as a result of the workshop can apply equally to all of Manitoba Hydro's construction projects in the Gillam area.

Mitigation includes preventative measures and monitoring to determine if further mitigation measures are required. Mitigation is geared not only to Members of FLCN and TCN, but also to construction workers on site and the broader community in Gillam.

As a part of orientation for all workers at the main site, workers will be required to participate in cultural awareness training. This will provide an opportunity to describe local expectations for respectful behaviour by construction workers both on site and when visiting communities. Camp rules and security measures can also assist in this regard.

Considerable uncertainty exists concerning the expected number of visits by non-local construction workers in SPSA communities (especially Gillam) and the expected number and type of adverse occurrences. Ongoing dialogue between Manitoba Hydro and the RCMP, who are responsible for policing in the SPSA communities, during the construction phase will assist

in identifying whether worker interaction is an issue in Gillam or in other SPSA communities. Discussion will also begin prior to construction among Manitoba Hydro, the Town of Gillam, FLCN and TCN to determine the best mechanism for tracking and addressing worker interaction issues and concerns across all of Manitoba Hydro's proposed projects in the vicinity of Gillam. It is anticipated that local justice and social agencies will be involved in these discussions, where appropriate, to gather data and to participate in the development of suitable mitigation measures.

With respect to aesthetics and the way the landscape looks, preferred routes and sites have been located near areas of existing disturbance wherever possible in order to minimize additional Project effects on the landscape.

Effects on culture and spirituality have been mitigated by selecting preferred routes and site locations for Project infrastructure that minimize effects on culturally important landscapes. Manitoba Hydro will also work with First Nations in the SPSA to organize a site ceremony for the Project to recognize the cultural and spiritual importance of the area to First Nations.

5.3 RESIDUAL EFFECTS

Following a consideration of mitigation measures, residual effects of the project remain for socio-economic VECs. Table 5-2 provides a summary of residual effects (following mitigation and enhancement) related to socio-economic VECs for the Project during the construction and operations periods. An assessment of the direction, magnitude, geographic extent and duration is provided for each residual effect.

5.3.1 Land and Resource Use

5.3.1.1 Domestic Resource Use

The Project will affect domestic resource use in the in SPSA during construction and for the life of the Project. Following mitigation, the residual effect is expected to be adverse, small in magnitude, of medium geographic extent and of long-term duration.

Access created by the existence of the right-of-ways for the Construction Power line and the Generation Outlet Transmission lines may allow access by individuals who would not previously have used the area. This effect may be considered positive in some respects (by allowing increased access to domestic resource users to some areas) and negative in other respects (by improving accessibility to other resource users or recreational users). Where access is a concern to communities, Manitoba Hydro will work with directly affected communities to prepare Access Management Plans prior to construction. On balance, the residual effects following mitigation are expected to be adverse, small in magnitude, small in geographic extent and long-term in duration.

5.3.1.2 Commercial Resource Use

The Project will affect commercial trapping activities in the SPSA during construction and for the life of the Project. Registered trapline holders will be notified and compensated consistent with Manitoba Hydro policy. Residual effects on commercial trapping are expected to be adverse, small in magnitude, medium in geographic extent and long-term.

5.3.1.3 Outdoor Recreation

Access to some trails and travel routes currently used for recreation may be disturbed or interrupted during the construction period. These effects are related generally to construction and transportation for all components of the Project and are not specific to any one component. Where access is a concern to communities, Manitoba Hydro will work with directly affected communities to prepare Access Management Plans prior to construction. Residual effects following mitigation are expected to be adverse, small in magnitude, small in geographic extent and short-term in duration.

The preferred routes for the Generation Outlet Transmission lines have been sited adjacent to existing or planned developments wherever possible. Therefore effects during the operations phase are not expected to be noticeable.

5.3.2 Economy

5.3.2.1 Direct Employment, Income and Business Opportunities

Workforce requirements during construction are expected to be cyclical and seasonal in nature. Transmission line work is expected to be concentrated in the winter months and therefore employment opportunities are generally expected to be short-term in nature. Enhancement measures include local hiring preferences and Northern purchasing policies. Residual effects are anticipated to be positive, moderate in magnitude, medium in geographic extent and short-term in duration.

Workforce requirements during the operations phase are expected to be small. On average, annual workforce requirements are expected to be approximately 11.5 persons. Two or three of these positions would be internal Manitoba Hydro staff with the remaining positions being contractors engaged on an as-required basis. Residual employment and business opportunity effects during the operations phase are therefore expected to be positive, small in magnitude, medium in geographic extent and long-term in duration.

5.3.2.2 Regional Supplies and Services

The Project will increase demand for supplies and services during the construction phase in the regional service area, including Split Lake, Fox Lake (Bird), Gillam and Thompson. Sectors

most likely to experience effects include construction equipment and material suppliers; restaurant and hospitality; transportation; and recreation services. TCN is positioned to provide supplies and services in certain areas including construction equipment and transportation services during the construction phase. FLCN businesses may also be able to provide construction related supplies and services. These effects may be perceived as positive by businesses with unused or under-utilized capacity or adverse by businesses or users or businesses that experience constraints on capacity. On balance, however, the net residual effect is expected to be positive, small in magnitude, large in geographic extent and short-term in duration.

During the operations phase, the Project is not anticipated to have a noticeable effect on the demand for regional supplies and services.

5.3.3 Population, Infrastructure and Services

5.3.3.1 Traffic and Transportation Infrastructure

The Project is expected to increase traffic volumes during the construction phase, particularly in the vicinity of Gillam and on PR 280 between Gillam and Thompson. Upgrades to PR 280 between Thompson and Gillam have been initiated by the Province of Manitoba as part of its 2012 infrastructure projects. By the time Project construction begins, the upgrades are intended to meet a standard that will improve safety and accommodate increased traffic (Keeyask Hydropower Limited Partnership 2012). Mitigation includes project construction and transportation workers implementing safe and responsible driving practices. The residual effect following mitigation is expected to be adverse, small in magnitude, medium in geographic extent and short-term in duration.

5.3.3.2 Health and Emergency Services

The presence of a temporary workforce may increase demands on health care and emergency services during the construction phase. The relatively small, temporary nature of the construction workforce is not anticipated to result in material additional requirements for health and emergency services. Mitigation includes adherence to provincial workplace health and safety legislation, Manitoba Hydro's safe construction policies and ongoing communication between Manitoba Hydro and the communities in the SPSA. Residual effects following mitigation are expected to be adverse, small in magnitude, medium in geographic extent and short-term in duration.

Workforce requirements during the operations phase are small and therefore no discernible effects on health and emergency services are anticipated during the operation phase.

5.3.3.3 Other Community Services

The majority of construction workers are anticipated to be accommodated in work camps near Gillam. These camps will not have substantial recreational amenities. Therefore the presence of a temporary workforce may increase demands on community services, particularly in Gillam, including recreation and leisure services during the construction phase. Mitigation includes ongoing communication between Manitoba Hydro and the communities to share information about expected workforce peaks and timing. Residual effects following mitigation are expected to be adverse, small in magnitude, medium in geographic extent and short-term in duration.

Workforce requirements during the operation phase are small and therefore no discernible effects on other community services are anticipated during the operations phase.

5.3.4 Personal, Family and Community Life

5.3.4.1 Workplace Health and Safety

During the construction phase, there may be effects to worker health and safety from accidents. It is anticipated there will be safety and accident prevention measures in place during the construction period. Exposure to drug and alcohol use at the construction camp will be mitigated through camp rules prohibiting the use of illegal drugs. Increased stress and anxiety for workers in new environments and away from families and home communities may also be experienced during the Project's construction phase. Mitigation measures include adherence to provincial workplace health and safety legislation and Manitoba Hydro's safe construction policies. Residual effects are expected to be adverse, small in magnitude, small in geographic extent and short-term in duration.

The average annual workforce requirement during the operations phase is expected to be small (approximately 11.5 persons on average). Therefore no discernible effects on workplace health and safety are anticipated during the Project's operation phase.

5.3.4.2 Health and Safety of Area Residents and Resource Users

During the construction phase, there may be effects on health and safety of area residents and resource users due to the presence of equipment and construction activities. Where access is a concern to communities, Manitoba Hydro will work with directly affected communities to prepare Access Management Plans prior to construction. Appropriate signage and fencing will also be in place during construction. Residual effects are anticipated to be adverse, small in magnitude, small in geographic extent and short-term in duration.

During the operations phase, the presence of the Construction Power line and the Generation Outlet Transmission lines may lead to effects on the health and safety of area residents and resource users. Accidents related to collisions with project infrastructure are possible. Site

security for the Construction Power Station, Keeyask Switching Station and Radisson Convertor Station will include perimeter fencing to limit access to the sites and reduce the potential for accidents involving area residents and resource users. Guy wire shields will be used to improve the visibility of guy wires for resource users and others travelling in the Project area. Residual effects are expected to be adverse, small in magnitude, small in geographic extent and long-term in duration.

5.3.4.3 Electro-magnetic Fields

Adverse effects to health during the operating phase related to electro-magnetic fields are not anticipated. Magnetic fields and electric fields outside the right-of-way are expected to be below limits recommended by provincial, national and international agencies. Residual effects are expected to be adverse, small in magnitude, small in geographic extent and long-term in duration.

5.3.4.4 Public Safety and Worker Interactions

The construction workforce is expected to be housed in temporary work camps close to Gillam. The limited recreation and leisure options that will be available at the construction work camp sites are likely to result in construction workers seeking out recreation and leisure options in Gillam. This leads to concerns about the potential for harmful interactions between workers and vulnerable community members. Effects noted during past projects include racism, increased alcohol and drug abuse, assaults and other violent crimes and inappropriate sexual behaviour between construction workers and community Members in the SPSA, including risks related to sexually transmitted infections (Keeyask Hydropower Limited Partnership 2012). FLCN and TCN are concerned about the potential for similar effects as a result of the Project.

Mitigation measures include preventative measures focused on construction workers at the Project site, coordinated discussion among Manitoba Hydro, the Town of Gillam, TCN and FLCN (where appropriate) to determine the best mechanism for tracking and addressing worker interaction issues and socio-economic monitoring and adaptive management. Residual effects are expected to be adverse, moderate in magnitude, medium in geographic extent and short-term in duration.

The permanent Manitoba Hydro workforce during the operations phase is expected to be small (2-3 persons). No discernible effects are anticipated during the operations phase of the Project.

5.3.4.5 Culture and Spirituality

Effects to domestic resource use and the way the landscape looks are also expected to lead to effects to culture and spirituality. Both TCN and FLCN view the ability to engage in domestic resource use activities as a fundamental means of cultural expression and transmission. Therefore adverse effects to domestic resource use and the landscape are also expected to

lead to adverse effects on culture and spirituality for TCN and FLCN. Mitigation includes route selection and site location selections designed to reduce effects on culturally important landscapes. Manitoba Hydro will also work with First Nations in the SPSA to organize a site ceremony for the Project to recognize the cultural and spiritual importance of the area to First Nations.

Residual effects are expected to be adverse, small in magnitude, medium in geographic extent and long-term in duration.

5.3.4.6 Physical Changes to the Landscape

The Project will create permanent changes to the landscape and aesthetics due to the presence of project infrastructure. Preferred routes and sites for Project infrastructure have been chosen adjacent to other existing or planned infrastructure developments wherever possible to minimize additional disturbance to the landscape caused by the Project. Residual effects are expected to be adverse, small in magnitude, medium in geographic extent and long-term in duration.

Table 5-2: Summary of Effects on Socio-economic Valued Components

Potential socio-economic effect	Project Phase	Mitigation	Residual socio-economic effect	Assessment Characteristics
Land and Resource Use				
Effects to domestic resource use.	Construction & Operations	• Preferred routes selected to minimize effects to resource use areas.	Effects to domestic resource use.	Direction: Adverse Magnitude: Small Geographic Extent: Medium Duration: Long-term
Rights-of-way create access for recreational hunters and other recreational resource users.	Construction & Operations	• Where access is a concern to communities, development of an Access Management Plan.	Rights-of-way create access for recreational hunters and other recreational resource users.	Direction: Adverse Magnitude: Small Geographic Extent: Small Duration: Long-term
Project will affect commercial trapping in the project footprint.	Construction & Operations	• Registered trapline holders will be notified and compensated consistent with Manitoba Hydro policy.	Project will affect commercial trapping in the project footprint.	Direction: Adverse Magnitude: Small Geographic Extent: Medium Duration: Long-term
Access to some trails and travel routes currently used for recreation may be disturbed during construction.	Construction	• Where access is a concern to communities, development of an Access Management Plan. • Generation Outlet Transmission preferred route follows existing infrastructure right-of-ways	Access to some trails and travel routes currently used for recreation may be disturbed during construction.	Direction: Adverse Magnitude: Small Geographic Extent: Small Duration: Short-term

Table 5-2: Summary of Effects on Socio-economic Valued Components

Potential socio-economic effect	Project Phase	Mitigation	Residual socio-economic effect	Assessment Characteristics
Economy				
Increased direct employment and business opportunities during construction.	Construction	• Local hiring preferences. • Northern purchasing policy.	Increased employment and business opportunities.	Direction: Positive Magnitude: Moderate Geographic Extent: Medium Duration: Short-term
Increased direct employment and contracting opportunities during operations.	Operations	• None required.	Increased employment and contracting opportunities.	Direction: Positive Magnitude: Small Geographic Extent: Medium Duration: Long-term
Increased demands for supplies and services including hospitality, recreation, transportation and construction equipment and materials.	Construction	• Ongoing communication between Manitoba Hydro, the communities and local businesses.	Increased demand for supplies and services.	Direction: Positive Magnitude: Small Geographic Extent: Large Duration: Short-term
Population, Infrastructure and Services				
Increased traffic in the vicinity of Gillam and on PR 280 between Gillam and Thompson.	Construction	• Project construction and transportation workers implement safe and responsible driving practices.	Increased traffic.	Direction: Adverse Magnitude: Small Geographic Extent: Medium Duration: Short-term

Table 5-2: Summary of Effects on Socio-economic Valued Components

Potential socio-economic effect	Project Phase	Mitigation	Residual socio-economic effect	Assessment Characteristics
Presence of construction workforce may increase demands on community health and emergency services.	Construction	• Adherence to provincial workplace health and safety legislation • Manitoba Hydro's safe construction policies. • Ongoing communication between Manitoba Hydro and the communities.	Increased demands on community health and emergency services.	Direction: Adverse Magnitude: Small Geographic Extent: Medium Duration: Short-term
Presence of construction workforce may increase demands on recreation and leisure services, particularly during construction.	Construction	• Ongoing communication between Manitoba Hydro and the communities.	Increased demands on community recreation and leisure services.	Direction: Adverse Magnitude: Small Geographic Extent: Medium Duration: Short-term
Personal, Family and Community Life				
Possibility of workplace accidents or health effects related to alcohol, drug use or workplace stress during construction.	Construction	• Adherence to provincial workplace health and safety legislation. • Manitoba Hydro's safe construction policies. • Manitoba Hydro EnvPP. • Camp rules.	Risks of workplace accidents.	Direction: Adverse Magnitude: Small Geographic Extent: Small Duration: Short-term

Table 5-2: Summary of Effects on Socio-economic Valued Components

Potential socio-economic effect	Project Phase	Mitigation	Residual socio-economic effect	Assessment Characteristics
Risk of accidents or injuries to area residents or resource users at construction site.	Construction & Operations	• Where access is a concern to communities, development of an Access Management Plan. • Appropriate signage and fencing for construction site. • Guy wire shields to improve visibility of guy wires to resource users and others who travel in the Project area.	Risk of accidents or injuries to area residents or resource users at construction site.	Direction: Adverse Magnitude: Small Geographic Extent: Small Duration: Long-term
Effects to human health from electro-magnetic fields.	Operations	• Monitoring of worldwide research. • Participation and support of on-going health and safety research. • Communication and provision of technical information to interested parties.	Effects to human health from electro-magnetic fields.	Direction: Adverse Magnitude: Small Geographic Extent: Small Duration: Long-term

Table 5-2: Summary of Effects on Socio-economic Valued Components

Potential socio-economic effect	Project Phase	Mitigation	Residual socio-economic effect	Assessment Characteristics
Risk to public safety related to influx of non-local construction workers.	Construction	• Preventative measures focused on construction workers at Project site including cultural sensitivity training. • Coordinated discussion among Manitoba Hydro, the Town of Gillam, TCN and FLCN (where appropriate) to determine the best mechanism for tracking and addressing worker interaction issues. • Socio-economic monitoring and adaptive management.	Risk to public safety.	Direction: Adverse Magnitude: Moderate Geographic Extent: Medium Duration: Short-term
Loss of cultural landscape and culturally important resource use opportunities	Construction and Operations	• Preferred routes selected to minimize effects to culturally important landscapes. • Manitoba Hydro will work with First Nations in the SPSA to organize a site ceremony for the Project.	Loss of cultural landscape and culturally important resource use opportunities	Direction: Adverse Magnitude: Small Geographic Extent: Medium Duration: Long-term
Physical changes to the landscape and aesthetics.	Construction and Operations	• Preferred routes selected to minimize effects to culturally important landscapes.	Physical changes to the landscape and aesthetics.	Direction: Adverse Magnitude: Small Geographic Extent: Medium Duration: Long-term

5.4 INTERACTIONS WITH FUTURE PROJECTS

Potential interactions of the Project with future projects were identified based on a consideration of the residual adverse effects described in Section 5.3 and planned or reasonably foreseeable projects that may have effects in the SPSA.

Future projects considered in the analysis include:

- Bipole III Transmission Project (including the Keewatinoow Convertor Station);
- Keeyask Generation Project;
- Gillam Redevelopment; and
- Conawapa Generation Project.

Potential interactions of these projects with are considered for all residual adverse effects of the Project identified in Section 5.3. Residual effects on the economy are anticipated to be positive, and therefore effects on the economy VEC are not discussed in this section.

5.4.1 Land and Resource Use

5.4.1.1 Domestic Resource Use

Effects to domestic resource use are expected to be addressed as required for each individual project. A consideration of any remaining residual effects of these future projects is not expected to alter the consideration of residual effects characteristics of the Keeyask Transmission Project.

5.4.1.2 Commercial Resource Use

Effects to commercial resource use are expected to be addressed as required for each individual project. A consideration of any remaining residual effects of these future projects is not expected to alter the consideration of residual effects characteristics of the Keeyask Transmission Project.

5.4.1.3 Outdoor Recreation

Overlaps of construction workforce requirements with the Keeyask Generation Station, Keewatinoow Convertor Station and potentially the Conawapa Generation Station could increase effects on outdoor recreation access and opportunities, particularly in the 2017-2018 period. The magnitude of residual effects when considering potential interactions with future projects may change from small to moderate in the short-term.

5.4.2 Population, Infrastructure and Services

5.4.2.1 Traffic and Transportation Infrastructure

Key concerns of interactions with future projects relates to additional wear and tear and traffic levels, in particular on PR 280. For example, during 2017 and 2018 there is expected to be substantial traffic as a result of the Keeyask Generation Station, Keewatinoow Convertor Station and potentially the Conawapa Generation Station. These higher traffic levels could accelerate the schedule for road refurbishment, maintenance and/or upgrades. Manitoba Hydro and Manitoba Infrastructure and Services will need to keep each other informed on a regular basis prior to and during periods of overlapping construction traffic to identify requirements for road improvements and traffic management.

In light of expected traffic related to future projects, in particular on PR 280, the magnitude of residual effects when considering potential interactions with future projects may change from small to moderate in the short-term.

5.4.2.2 Health and Emergency Services

Overlaps of construction workforce requirements with the proposed Keeyask Generation Project, Keewatinoow Convertor Station and potentially the Conawapa Generation Project could increase demands on health and emergency services, particularly in the 2017-2018 period. The magnitude of residual effects when considering potential interactions with future projects may change from small to moderate in the short-term. Ongoing communication between Manitoba Hydro and the communities in the SPSA, as well as adherence to provincial workplace health and safety legislation can help to mitigate the potential combined effects of these Projects.

5.4.2.3 Other Community Services

Overlaps of construction workforce requirements with the proposed Keeyask Generation Project, Keewatinoow Convertor Station and potentially the Conawapa Generation Project could increase demands on community recreation and leisure services, particularly in the 2017-2018 period. This is expected to be mitigated to some degree by the presence of recreation and leisure opportunities at the main Keeyask Generation Project construction camp. The magnitude of residual effects when considering potential interactions with future projects may change from small to moderate in the short-term. Ongoing communication between Manitoba Hydro and the communities in the SPSA, can help to mitigate the potential combined effects of these Projects.

5.4.3 Personal, Family and Community Life

5.4.3.1 Workplace Health and Safety

Overlaps of construction workforce requirements with the Keeyask Generation Station, Keewatinoow Convertor Station and potentially the Conawapa Generation Station could increase effects on workplace health and safety, particularly in the 2017-2018 period. The magnitude of residual effects when considering potential interactions with future projects may change from small to moderate in the short-term. Adherence to workplace health and safety legislation and Manitoba Hydro's safe construction policies can help to mitigate the potential combined effects of these Projects.

5.4.3.2 Health and Safety of Area Residents and Resource Users

Overlaps of construction workforce requirements with the Keeyask Generation Station, Keewatinoow Convertor Station and potentially the Conawapa Generation Station could increase effects on health and safety of area residents and resource users, particularly in the 2017-2018 period. The magnitude of residual effects when considering potential interactions with future projects may change from small to moderate in the short-term. Where access is a concern to communities, Manitoba Hydro will work with directly affected communities to prepare Access Management Plans prior to construction. Appropriate signage and fencing for the construction site can also help mitigate these effects.

Effects during the operations phase are not anticipated to combine with other potential future projects.

5.4.3.3 Electro-magnetic Fields

Adverse effects to health during the operating phase related to electro-magnetic fields are not anticipated to overlap with other potential future projects.

5.4.3.4 Public Safety and Worker Interactions

The residual adverse effects of the Keeyask Transmission Project have the potential to interact with adverse effects of other projects and activities planned during the construction phase. Mitigation measures have been designed to address these potential interactions including:

- Mitigation measures to reduce the number of worker visits, as well as an overall coordinated approach to address worker interaction have been incorporated into the assessment of the Keeyask Generation Project and the Bipole III Transmission Project EIS, particularly in relation to the Keewatinoow Converter Station.

- Additional mitigation in the form of ongoing coordination with Manitoba Hydro, contractors, monitoring advisory committees, the RCMP and social groups will be necessary to reduce the risk of adverse effects.
- Ongoing monitoring will be a necessary component of all Manitoba Hydro projects and activities in the vicinity of Gillam in particular. Further discussion with the RCMP is recommended to facilitate appropriate level of staffing and to determine how best to track incidents related to separate projects.

Given the sizeable increase in the number of potential visits to Gillam by non-local construction workers and added adverse interaction opportunities, the planning for each of the future projects discussed in this section will need to address incremental mitigation and monitoring as required and reviewed above. Coordinated planning in this regard will be facilitated to the extent that Manitoba Hydro is responsible for these future projects.

Assuming the above mitigation and monitoring occurs, residual effects characteristics of the Keeyask Transmission Project are not changed by the consideration of interactions with future projects.

5.4.3.5 Culture and Spirituality

Effects to domestic resource use and associated effects on culture and spirituality are expected to be addressed as required for each individual project. A consideration of any remaining residual effects of these future projects is not expected to alter the consideration of residual effects characteristics of the Keeyask Transmission Project.

5.4.3.6 Physical Changes to the Landscape

The preferred routes and sites for Project infrastructure have been selected to minimize the creation of new disturbance areas, including future infrastructure related to the projects noted above. Therefore a consideration of potential interactions with future projects is not expected to alter the effects characteristics of the Keeyask Transmission project.

5.5 MONITORING

Project specific monitoring plans are designed to verify predictions or identify unanticipated effects. A socio-economic monitoring plan for the Project will be developed and finalized based on Licence conditions issued for the Project. In particular, it is anticipated the socio-economic monitoring plan would be developed to monitor:

- Access to the site and transportation during the construction phase;

- Effects of the Project on employment for local communities and the economic activity generated by the Project; and
- Worker interaction and public safety concerns.

In addition, it is anticipated Manitoba Hydro will track statistics collected by the Province on traffic-related incidents and complaints on PR 280.

6.0 CONCLUSIONS

This report assesses potential environmental effects of the preferred route and sites for Keeyask Transmission Project infrastructure. Residual effects of the Project were identified in Section 5.3 for each of the land and resource use; population, infrastructure and services; economy and personal family and community life VECs, as follows:

- **Land and Resource Use**: Residual adverse effects are anticipated to include:
  - □ Effects to domestic resource use during the construction and operations phases;
  - □ Creation of access for recreational hunters and other recreational resource users during the construction and operations phases;
  - □ Effects on commercial trapping during the construction and operations phases; and
  - □ Disturbance of access to some trails and travel routes currently used for recreation during the construction phase of the project.
- **Economy:** Residual positive effects are anticipated to include:
  - □ Increased direct employment and contracting opportunities during construction and operations; and
  - □ Increased demands for supplies and services during the construction phase.
- **Population, Infrastructure and Services:** Residual adverse effects are anticipated to include:
  - □ Increased traffic in the vicinity of Gillam and on PR 280 between Gillam and Thompson during the construction phase;
  - □ Increased demands on community health and emergency services during the construction phase; and
  - □ Increased demands on recreation and leisure services during the construction phase.
- **Personal, Family and Community Life:** Residual adverse effects are anticipated to include:
  - □ Possibility of workplace health effects during the construction phase;

- Possibility of accidents or injuries to area residents or resource users at the construction site during the construction phase;
- Effects to human health from electro-magnetic fields during the operations phase;
- Risks to public safety related to an influx of non-local construction workers during the construction phase;
- Loss of cultural landscape and culturally important resource use opportunities during construction and operations; and
- Physical changes to the landscape and aesthetics during construction and operations.

Mitigation measures recommended in this report include:

- Where access is a concern to communities, Manitoba Hydro will work with directly affected communities to prepare Access Management Plans prior to construction;
- Compensation of affected registered trapline holders consistent with Manitoba Hydro policy;
- Selection of a preferred Generation Outlet Transmission line route that follows existing infrastructure right-of-ways;
- Implementation of safe and responsible driving practices by project construction and transportation workers;
- Adherence to provincial workplace health and safety legislation and Manitoba Hydro's safe construction policies;
- Ongoing communication between Manitoba Hydro, communities in the SPSA and other agencies;
- Local hiring preferences and northern purchasing policies consistent with Manitoba Hydro practice;
- Appropriate signage and fencing for construction sites;
- Guy wire shields to improve visibility of guy wires;
- Adherence to Manitoba Hydro's EnvPP;

- Monitoring of worldwide research, participation and support of on-going health and safety research and communication and provision of technical information to interested parties related to EMF;
- Preventive measures such as cultural awareness training for construction workers at the Project site and camp rules and security;
- Coordinated discussion among Manitoba Hydro, the Town of Gillam, TCN and FLCN (where appropriate) to determine the best mechanisms for tracking and addressing worker interaction issues;
- Site ceremony to recognize the cultural importance of the area to First Nations; and
- Socio-economic monitoring and adaptive management.

Finally, the report describes monitoring activities that are expected to be in place including:

- Monitoring of access to the site and transportation during the construction phase;
- Monitoring of effects of the Project on employment for local communities and the economic activity generated by the Project;
- Monitoring related to worker interaction and public safety concerns; and
- Monitoring complaints and traffic incidents information collected by the province.

7.0 GLOSSARY

Average annual daily traffic: A number representing the number of vehicles passing a point on an average day of the year

Cree Nation Partners (CNP): The Cree Nation Partners Limited Partnership is controlled by Tataskweyak Cree Nation (TCN) and War Lake First Nation (WLFN).

Converter station: The terminal equipment for a high voltage direct current transmission line, in which alternating current is converted to direct current or direct current is converted to alternating current.

Country food: Traditional diet of Aboriginal people, particularly those living in northern regions, includes various forms of meat, fish, waterfowl and berries that can be hunted, fished and gathered from the land.

Employment rate: The percentage of the total population 15 years of age and over that was employed in the week (Sunday to Saturday) prior to Census Day (June 4, 1991; May 15, 2001; May 16, 2006).

Environmental assessment (EA): Process for identifying project and environment interactions, predicting environmental effects, identifying mitigation measures, evaluating significance, reporting and following-up to verify accuracy and effectiveness leading to the production of an Environmental Assessment report. EA is used as a planning tool to help guide decision-making, as well as project design and implementation (Canadian Environmental Assessment Agency).

Kinship: Connection by blood, marriage, or adoption; family relationship.

Labour force: Refers to persons who were either employed or unemployed during the week prior to Census Day. Persons not in the labour force include those who were not employed or looking for work such as homemakers, retired workers, students, seasonal workers in the 'off' season and those who were not able to work because of long-term illness or disability.

Participation rate: Refers to the number of people in the labour force as a percentage of the total population, excluding institutional residents.

Transformer station: A transmission station which includes power transformer, to convert power to the appropriate voltage for delivery to regional subtransmission or distribution facilities, or to the higher voltage required for economical and efficient transmission over longer distances to a load centre.

Transmission line: A conductor or series of conductors used to transmit electricity from the generating station to a substation or between substations.

Unemployment rate: The percentage of the labour force in the week (Sunday to Saturday) prior to Census Day (June 4, 1991; May 15, 2001; May 16, 2006) that was unemployed.

8.0 ACRONYMS

Acronym/Abbreviation	Term
AADT	average annual daily traffic
ATK	Aboriginal traditional knowledge
CD	compact disc
CEA	Cumulative effects assessment
CN	Canadian National
CNP	Cree Nation Partners
EA	Environmental assessment
EMF	electro-magnetic field
FLCN	Fox Lake Cree Nation
GHA	Game Hunting Area
GOT	Generation Outlet Transmission
INAC	Indian and Northern Affairs Canada
JKDA	Joint Keeyask Development Agreement
KIP	Keeyask Infrastructure Project
MIT	Manitoba Infrastructure and Transportation
MTS	Manitoba Telecom Services
NOC-S	National Occupational Classification for Statistics
pers. comm.	Personal communication
PR	provincial road
PSA	Project Study Area

RCMP	Royal Canadian Mounted Police
SLRMA	Split Lake Resource Management Area
SPSA	Socio-economic Project Study Area
TCN	Tataskweyak Cree Nation
VEC	Valued environmental component

Abbreviations	**Units**
ha	hectare (10,000 m^2)
km	kilometre
kV	kilovolt
m	metre
%	per cent

9.0 REFERENCES

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