LAKE WINNIPEG EAST SYSTEM IMPROVEMENT TRANSMISSION PROJECT

Licensing and Environmental Assessment Department

Transmission Planning and Design Division

Transmission Business Unit

Manitoba Hydro

EXECUTIVE SUMMARY

1.0 PURPOSE

The Lake Winnipeg East System Improvement (LWESI) Transmission Project (the Project) is required to provide system upgrades in the region east of Lake Winnipeg. The Project will serve existing and new load growth, and provide firm transformation and adequate voltage support for the communities located in and around the region. It is expected that this new development will meet the electrical requirements for at least the next twenty years.

The Project includes the construction of a new 115 kilovolt (kV) transmission line from Powerview-Pine Falls, Manitoba to Manigotagan [Pine Falls – Manigotagan 115 kV Transmission Line (PQ95)], approximately 75 kilometers (km) north of Powerview-Pine Falls. The project will require the development of a new 115-66 kV transmission station (Manigotagan Corner Station) west of the intersection of Provincial Road #304 and the Rice River Road, near the community of Manigotagan. This station will serve as the terminal for the new 115 kV transmission line as well as the existing 66 kV sub-transmission lines in the Manigotagan area.

This Environmental Assessment (EA) report was written to meet the licensing requirements of The Manitoba *Environment Act* for transmission lines and stations of 115 kV or greater.

2.0 PROJECT STUDY AREA

The Project Study Area includes an area of approximately 2,112 km^2 and extends from south of the community of Powerview-Pine Falls, north to the community of Manigotagan, and from the eastern boundary of Lake Winnipeg, to approximately 10 km east of Provincial Road (PR) # 304. The Project Study Area contains three Alternate Routes and the Final Preferred Route for Transmission Line PQ95, a 60 m wide right-of-way (ROW) centred on the line route, the Manigotagan Corner Station and the Pine Falls Generating Station Switchyard. The Project Study Area was chosen to be of sufficient size to assess any potential project effects on biophysical and socioeconomic components.

3.0 PROJECT COMPONENTS

The Project consists of the construction of three components:

- a new 115 kilovolt (kV) alternating current (AC) transmission line originating from Powerview-Pine Falls, Manitoba and terminating near the community of Manigotagan;
- a new 115-66 kV transmission station to be located near Manigotagan, referred to as Manigotagan Corner Station; and
- equipment additions required at the existing Pine Falls Generating Station Switchyard (Switchyard) which is located immediately south of the Pine Falls Generating Station.

4.0 PROPOSED PROJECT SCHEDULE

Receipt of an Environment Act Licence for the LWESI Transmission Project is targeted for March 2013. Upon receipt of the environmental licence, property acquisition for the Manigotagan Corner Station and the Line PQ95 ROW will be completed.

Project construction will occur over three years from 2013 to 2015. Clearing of the ROW for the overhead portion of the line will begin in December 2013, and is expected to be complete by the end of April 2014. Construction will begin during this period and the overhead portion of line will be complete by the end of April 2015. The underground and suspended portion of line that extends from the Switchyard to the Pine Falls Generating Station is scheduled to occur between June and August 2014. The transmission line is scheduled for commissioning and in-service in November 2015.

Site preparation for the Manigotagan Corner Station will begin in March and April 2013. Site improvement and fence construction will extend from August to November of 2013. Foundations, buildings and final site surface will be undertaken from August 2014 to May 2015. The station will be tested, commissioned and in-service for November 2015.

The equipment additions at the Pine Falls transmission station will begin in November 2014 and be complete by the end of September 2015. Commissioning and in-service is targeted for November 2015.

5.0 SITE SELECTION AND ENVIRONMENTAL ASSESSMENT PROCESS

The Site Selection and Environmental Assessment (SSEA) process to select a route for Line PQ95 considered a broad range of biophysical, socio-economic, and stakeholder involvement information to systematically refine route alternatives and select a Final Preferred Route. Manitoba Hydro sought to avoid adverse environmental effects and enhance potential benefits whenever possible and practical. Where project effects could not be avoided, the Final Preferred Route was selected that best lent itself to effective mitigation and sound management for limiting potential effects to the environment and stakeholders.

Valued Ecosystem Component Selection

The environmental assessment was focused on Valued Environmental Components (VECs), which are aspects of the natural and socio-economic environment that are particularly notable or valued because of their ecological, scientific, resource, socio-economic, cultural, health, aesthetic, or spiritual importance. Twenty-two VECs were selected which balanced biophysical and socioeconomic components, and represented both potential positive and negative effects of the Project.

Environmental Assessment Approach

Mitigation measures were considered to avoid or reduce effects of the Project on biophysical and socio-economic components within the Project Study Area. Residual effects were identified, and the significance of these effects was assessed through considering the magnitude,

geographic extent, duration, frequency and reversibility of the effects. Interactions between significant residual effects of the Project and ongoing and future projects and activities in the Project Study Area were considered for assessment of cumulative effects.

6.0 ROUTE SELECTION PROCESS

The route selection process for Line PQ95 involved selection and refinement of Alternative Routes based on evaluation criteria that reflected the importance of socio-economic, biophysical, cost and technical factors. These criteria, as well as valuable feedback obtained from the Public Engagement Program (PEP), became the basis from which to compare and evaluate the alternative routes.

The Manigotagan Corner Station site was selected on the basis of engineering and technical criteria. The preferred station site was integrated into the PEP and received favorable feedback from local community representatives.

7.0 RESIDUAL EFFECTS ASSESSMENT

Biophysical and socio-economic environmental components were evaluated as the SSEA progressed in an iterative manner towards selection of Preferred Routes and Station Sites. The Project transmission lines and station sites were assessed by members of Manitoba Hydro's Study Team, as identified in the preface to each technical report.

Some potential effects were avoided altogether through siting and routing. Where potential adverse effects could not be avoided, specialists and Manitoba Hydro staff discussed mitigation measures that would either eliminate, or reduce, potential adverse effects on each VEC that was foreseeably adversely affected by one or other Project component. After taking into account mitigation measures that were to be adopted, the likely remaining residual effects of the Project on each VEC were evaluated for their regulatory significance. Determining the regulatory significance of the residual effects required the Study Team's opinions on the characterization of the effect (direction or nature, magnitude, duration and geographic extent), the likelihood of the effect actually occurring and the expected results of development and implementation of follow-up management plans to address uncertainties. The frequency, reversibility and ecological context of the Project-related effect on a VEC were also considered, where appropriate, in the determination of the significance of the effect.

The assessment of the potential effects and appropriate mitigation measures led to the determination that the residual effects of the Project are not significant. The overall conclusion of the Environmental Assessment Report with respect to residual effects is summarized as follows:

- Soils, Hydrogeology and Geology:
    - Residual effects include erosion and compaction and are considered to be small in magnitude, within the Project footprint, and short to long-term in duration.

- Aquatic Environment:
  - Residual effects on fish habitat are considered to be negligible to small in magnitude, local in geographic extent, and largely short-term in duration.

- Vegetation:
  - Residual effects include the loss of ash forest, and a loss of habitat for species of conservation concern associated with mature forest (Hooker's orchid and checkered rattlesnake plantain). These effects are considered to be small in magnitude, project footprint in geographic extent, and short to long-term in duration and are reversible upon decommission of the project.

- Wildlife:
  - Residual effects include wildlife abundance and habiat alteration and are considered to be negligible to small in magnitude, within the Project footprint to local in geographic extent, and short to medium-term in duration.

- Forestry:
  - Residual effects include the loss of productive forestland resulting in a reduction in sustainable annual allowable cut (AAC) levels, and a reduction in Forest Management Licence (FML) 01 area and loss of standing timber. are considered to be small in magnitude, project footprint in geographic extent, and medium-term in duration and are reversible upon decommission of the project.

- Socio-economics and Land Use:
  - Residual effects are associated with the construction phase of the project and include minor effects on traffic, a minor decrease in the availability of temporary accommodation, a minor increase in pressure on health services, a minor decrease in trapping harvest, and an increase in employment opportunities in the Project Study Area.

- Heritage Resources:
  - No residual effects are expected to known heritage resources since no such resources were identified within the Final Preferred Route ROW.

- Cultural Resources:
  - No residual effects are expected.

Cumulative Effects Assessment

Some overlap between significant residual effects and ongoing and future projects and activities within the Project Study area was identified. This included increased loss of productive forest habitat and habitat for some species of conservation concern. However, given that the loss of forest habitat was estimated to represent less than 1% of available habitat within the Project Study Area, these cumulative effects were not deemed to be significant.

8.0 NEXT STEPS

Prior to initiating construction, including rights-of-way clearing, Manitoba Hydro will prepare an Environmental Protection Plan (EnvPP) for approval by Manitoba Conservation and Water Stewardship. Application of the EnvPP will assure that all personnel, including contractors and Manitoba Hydro management take diligent steps to protect the environment. This will involve:

- inspection – to ensure implementation of the terms and conditions of Project approval during Project construction and operation;
- effects monitoring – to measure the environmental changes attributable to Project construction and/or operation and check the effectiveness of mitigation measures;
- compliance monitoring – to ensure that applicable regulatory standards and requirements are being met;
- management – prepare plans to address important management issues, regulatory requirements and corporate commitments;
- environmental auditing – to verify the implementation of terms and conditions, the accuracy of the predictions, the effectiveness of mitigation measures, and the compliance with regulatory requirements and standards; and
- updating and review – finalizing, review and updating of draft EnvPP to include stipulated terms and conditions of the Environment Act Licence.

Manitoba Hydro has identified environmentally acceptable means for salvaging equipment and restoring affected sites and rights-of-way for decommissioning of transmission lines and station facilities.

Manitoba hydro believes that the LWESI Transmission project will not have significant effects on the environment. Any residual effects on the environment will be managed through mitigation and monitoring.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

LIST OF APPENDICES

LIST OF ACRONYMS

%	percent
°C	degrees Celsius
µg/L	micrograms per litre
ATK	Aboriginal Traditional Knowledge
CEA Act	*Canadian Environmental Assessment Act*
cm	centimetres
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSA	Canadian Standards Association
CSS	Culturally Sensitive Site
DOC	Dissolved organic carbon
EA	Environmental Assessment
EAPF	Environment Act Proposal Form
EMS	Environmental Management System
EnvPP	Environmental Protection Plan
EPIMS	Environmental Protection Information Management System
EPP	Environmental Protection Program
ft	foot/feet
GHA	Game Hunting Area
ha	hectare
HADD	Harmful Alteration, Disruption or Destruction
IRMT	Integrated Resource Management Team
ISO	International Organization for Standardization
kg	kilogram
km	kilometres
km/h	kilometres per hour
KPI	key person interviews
kV	kiloVolt
L	litre
Line PQ95	Pine Falls–Manigotagan 115 kV Transmission Line
LWESI	Lake Winnipeg East System Improvement
m	metre

m/s	metres per second
m^3/s	cubic metres per second
MBCDC	Manitoba Conservation Data Centre
MBESA	*Endangered Species Act* (Manitoba)
MCWS	Manitoba Conservation and Water Stewardship
mg/L	milligrams per litre
mm	millimetre
NTU	nephelometric turbidity units
OPGW	Optical Ground Wire
PEP	Public Engagement Program
PR	Provincial Road
ROW	right-of-way
RV	Recreational Vehicle
SARA	*Species at Risk Act*
SSEA	Site Selection and Environmental Assessment
Switchyard	Pine Falls Generating Station Switchyard
TAC	Technical Advisory Committee
the Project	Lake Winnipeg East System Improvement Transmission Project
VEC	Valued Environmental Component

1.0 INTRODUCTION

1.1 PROJECT NEED AND JUSTIFICATION

The Lake Winnipeg East System Improvement (LWESI) Transmission Project (the Project) is required to provide system upgrades in the region east of Lake Winnipeg. This project will serve existing and new load growth, provide firm transformation and adequate voltage support for the communities located in and around the region. The transmission line will also enhance the operation of the region's existing 66 kiloVolt (kV) sub-transmission network by reducing the overall line length of that system. It's expected that this new development will meet the electrical requirements for at least the next twenty years.

The Project includes the construction of a new 115 kV transmission line, from Powerview-Pine Falls, Manitoba to Manigotagan, located approximately 75 km north of Powerview-Pine Falls. This new line will be named the Pine Falls–Manigotagan 115 kV Transmission Line (Line PQ95). The Project will also require the development of a new 115-66 kV transmission station named the Manigotagan Corner Station Site to be developed immediately west of the intersection of Provincial Road (PR) #304 and the Rice River Road, near the Community of Manigotagan. This station will provide the terminal for the new 115 kV transmission line as well as the existing 66 kV sub-transmission lines in the Manigotagan area.

The new 115 kV Line PQ95 will originate from the existing Pine Falls Generating Station Switchyard (the Switchyard) located in Powerview-Pine Falls. Modifications within the existing fenced area of the Switchyard are required to connect this new line to Manitoba Hydro's existing transmission system.

1.1.1.1 Environmental Background

This project will be similar to other transmission lines and stations of that voltage which have been constructed and are in operation in the Province of Manitoba. The environmental effects associated with these types of transmission lines and stations are generally related to direct effects of construction and operation.

Manitoba Hydro has used a Site Selection and Environmental Assessment (SSEA) process for several decades, to site and asses the effects of transmission projects. The process has evolved to keep abreast of and implement new technologies and address the evolution of legislative requirements. This SSEA process has been implemented for this project to avoid, reduce, or mitigate the potential effects in a feasible and practical manner. This process tries to avoid potential environmental effects where possible, and propose resolution or mitigation for any outstanding or residual issues. As this project is located predominantly in a boreal environment, planning process for the project focussed on natural resource and resource user activities associated with this region.

1.2 PURPOSE OF THE DOCUMENT

The purpose of this document is to satisfy Manitoba Hydro's SSEA process in order to secure a provincial environmental licence for transmission lines and stations of 115 kV or greater and to present information required to meet the licensing requirements of the *Manitoba Environment Act*.

1.3 MANITOBA HYDRO'S TRANSMISSION SYSTEM

1.3.1 Mission Vision and Goals

Manitoba Hydro is a Crown Corporation owned by the Province of Manitoba, with the main offices located in Winnipeg. Manitoba Hydro's mandate is to supply adequate power to meet the needs of the Province of Manitoba, and to promote economy and efficiency in the development, generation, transmission, distribution, supply, and end-use of power. Manitoba Hydro generates, transmits and distributes electrical energy throughout the Province, and is a distributor of natural gas within some Manitoba communities. The affairs of Manitoba Hydro are administered by the Manitoba Hydro-Electric Board appointed by the Lieutenant-Governor in Council. The Board reports to the Minister responsible for the *Manitoba Hydro Act* who, in turn, reports to the Manitoba Legislative Assembly.

Manitoba Hydro currently serves more than 537,000 electricity customers throughout the Province and provides natural gas service to over 265,000 customers in various communities. Manitoba Hydro is one of the largest integrated electricity and natural gas distribution utilities in Canada. Manitoba Hydro employs more than 6,200 people, has assets in excess of $12.5 billion and annual revenues of more than $1.7 billion (Manitoba Hydro 2011). For 60 years Manitoba Hydro's projects focussed primarily on the development of renewable hydro-electric power, and have played a major role in the development of the provincial economy and the Province as a whole. From the 1950s, Manitoba Hydro has been a principal engine chosen by a succession of provincial governments to open Manitoba's north for the benefit of all of its citizens. Manitoba Hydro and its staff are key elements in the fabric of Manitoba.

Manitoba Hydro's Corporate Vision is:

"To be the best utility in North America with respect to safety, rates, reliability, customer satisfaction, and environmental leadership; and to always be considerate of the needs of customers, employees, and stakeholders" (Manitoba Hydro 2012a).

1.3.2 Environmental Policy and Management System

Manitoba Hydro respects the need to protect and preserve natural environments, social, economic and heritage resources affected by its projects and facilities and it does so through the following practices:

- Preventing or minimizing any adverse impacts on the environment, and enhancing positive impacts;

- Continually improving our Environmental Management System (EMS);
- Meeting or surpassing regulatory, contractual and voluntary requirements;
- Considering the interest and utilizing the knowledge of our customers, employees, communities, and stakeholders who may be affected by our actions;
- Reviewing our environmental objectives and targets annually to ensure improvement in our environmental performance; and
- Documenting and reporting our activities and environmental performance (Manitoba Hydro 2012b).

In addition, Manitoba Hydro's environmental management policy has been incorporated into the Project development plan. A Draft Environmental Protection Plan (EnvPP) for the Project has been developed as a separate document (Appendix 1) in support of this Environmental Assessment (EA) Report. The use of environmental protection plans is a practical and direct response to the implementation of Manitoba Hydro's commitment to responsible environmental stewardship.

Manitoba Hydro has developed and implemented an EMS and has registered the system to the International Organization for Standardization (ISO) 14001 EMS standard. The Manitoba Hydro EMS enables the identification of environmental effects, setting of goals to manage effects, implementation of plans to meet the goals, and evaluation of performance. The EMS enables Manitoba Hydro to make continual improvements to its EMS and its environmental performance. As a member of the Canadian Electrical Association, Manitoba Hydro participates in the Sustainable Electricity Program. Under this program every member utility must implement an EMS consistent with ISO standards.

1.4 REGULATORY FRAMEWORK

1.4.1 Federal – Provincial Coordination

The Canada-Manitoba Agreement on Environmental Assessment Cooperation provides a mechanism to address both provincial and federal requirements with a single environmental assessment, administered by both governments, but with the primary point of contact being the provincial environmental assessment agency, Manitoba Conservation and Water Stewardship (MCWS) (Canada–Manitoba Agreement on Environmental Assessment Cooperation 2007)

1.4.2 Provincial Environmental Assessment and Permitting

At a voltage capacity of 115 kV, the proposed LWESI Project meets the requirements of a Class II Development as defined by the Classes of Development Regulation 164/88 under the *Manitoba Environment Act*. The Project will therefore require an Environment Act Licence prior to the initiation of any works. An Environment Act Licence is the primary enabling permit for the Project. Class II developments are required to submit an Environment Act Proposal Form

(EAPF) and EA Report to MCWS to enable public and government agencies to examine the details of the proposed project, its anticipated effects on biophysical and socio-economic aspects of the environment, and identify measures that Manitoba Hydro intends to use to mitigate potential residual effects. Under the provincial EA process, only the Project components requiring a permit should be included in the EA Report. An Environment Act Licence is issued upon the Minister's acceptance of the EAPF and EA Report.

The coordination of approvals begins with the establishment of an interdepartmental review panel called the Technical Advisory Committee (TAC), which is led by MCWS, Environmental Approvals Branch, and consists of provincial and federal government representatives with the technical expertise necessary to assess the potential effects of a project. Following submission of the EAPF and EA Report, a technical and public review is conducted where the submissions are made available for public review through the public registry system of MCWS. At the end of the public review and comment period, the Director of Environmental Approvals Branch will assess the level of public concern. If the Director determines there is significant public concern, the Director will recommend to the Minister that the Clean Environment Commission hold a public hearing. The Commission makes recommendations to the Minister based on the findings of the hearing. Based on the results of the project screening, the Minister will either issue or refuse a Licence. Issuance of an Environment Act Licence, and the terms and conditions it may contain, will be based on this submission and public input.

This document describes the SSEA process and constitutes the EA Report for the proposed project. It is being submitted to MCWS as the Manitoba Hydro application for environmental licensing of the project under the *Manitoba Environment Act.*

1.4.3 Federal Environmental Assessment and Permitting

The *Canadian Environmental Assessment Act (CEA Act* 2012*)* establishes a federal environmental assessment process in order to achieve sustainable development by promoting economic development that conserves and enhances environmental quality. The *Act* requires an assessment of the environmental effects of a project if federal authorities have to make a decision regarding some aspect of the project. A federal environmental assessment may be triggered or authorization pursuant to the provisions of Section 5 of the *Act*. The Project, at 115 kV is not considered a physical activity, therefore it is not expected to have any *CEA Act* triggers.

Manitoba Hydro will comply with federal requirements, including Department of Fisheries and Oceans Operational Guidelines to assure that the Project incorporates appropriate procedures to avoid negative effects on fish and fish habitat. The design of the transmission line crossings of the major rivers will meet the Canadian Standards Association guidelines for river crossings and therefore satisfy the requirements of the federal *Navigable Waters Protection Act* and not interfere with navigation.

1.5 OUTLINE OF ENVIRONMENTAL ASSESSMENT REPORT

This EA Report includes an examination and consideration of the potential effects that may result from the Project to:

- Physical Environment – Atmosphere (air, climate and climate change), land (terrain, geology, soils), and water (surface, groundwater, water quality).
- Biological Environment – Aquatic biota and habitat, terrestrial ecosystems and vegetation, terrestrial species and habitat (mammals, birds, amphibians, reptiles, invertebrates).
- Land and Resource Use – Commercial resource use (forestry, mining, agriculture, fishing), protected areas, Aboriginal land and resource use, recreation and tourism (including aesthetics), property ownership, infrastructure services and facilities.
- Socio-economic and Cultural Conditions – Population and demographics, economic base, personal, family and community life (including human health and well-being, employment and income), local community, traditional rights and heritage and cultural resources.

This EA Report is organized as follows:

- **Chapter 2.0 Project Description** provides a detailed description of the Project, including the new 115 kV transmission line, and new 115-66 kV transmission station; and modification to the existing transmission station;
- **Chapter 3.0 Site Selection and Environmental Assessment** describes the SSEA process that was used for this project;
- **Chapter 4.0 Existing Environment** describes the existing biophysical and socio-economic environment in the Project area. This chapter provides the baseline environmental conditions for the Project area;
- **Chapter 5.0 Public Engagement** provides the purpose and objectives of the Public Engagement Program (PEP), the process used for public engagement including the types and formats of venues. This chapter also discusses the public engagement results;
- **Chapter 6.0 Identification and Evaluation of Alternative Routes** provides the approach for selecting the transmission line route and station site a comparison of the route alternatives, and a description of the Preferred Route and Station Site. This chapter also identifies the additional steps taken in the public engagement process to address stakeholder and landowner concerns;
- **Chapter 7.0 Effects Assessment** identifies and evaluates the environmental effects of the Project, provides methods to mitigate potential residual effects, as well as cumulative effects and methods for sustainable development; and
- **Chapter 8.0 Environmental Protection, Follow-up and Monitoring** describes the environmental protection, monitoring and follow-up activities, and provides a Draft EnvPP.

Information from nine discipline-specific technical reports was used to prepare this EA Report.

2.0 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

The proposed LWESI Project consists of the construction of three components:

- a new 115 kV alternating current (AC) transmission line originating from Powerview-Pine Falls, Manitoba and terminating near the community of Manigotagan. This Project component is referred to as the Pine Falls-Manigotagan 115 kV Transmission Line. It also has been designated as Line PQ95;
- a new 115-66 kV transmission station to be located near Manigotagan. This station is referred to as Manigotagan Corner Station. Manigotagan is located approximately 75 kilometres (km) north of Powerview-Pine Falls; and
- equipment additions required at the existing Switchyard. This Switchyard is located immediately south of the Pine Falls Generating Station and is part of the generating station complex.

2.2 PROJECT COMPONENTS

2.2.1 Pine Falls – Manigotagan 115 kV Transmission Line (Line PQ95)

The engineering details for Line PQ95 are based on preliminary design, current technical requirements and established construction policies and practices. The final transmission line design might vary based on the final approved route, more detailed investigation of site conditions, contract requirements, and evolving standards and regulations. Final engineering design will be completed subsequent to receipt of the Environment Act Licence and will take into account pertinent conditions of that licence. Specific structure placements will be finalized after the right-of-way (ROW) has been procured and surveyed.

Manitoba Hydro identified conceptual alternative transmission route options in order to initiate preliminary planning for this Project component. These options focus routing close to PR #304 which provides all-weather road service from Powerview-Pine Falls to Manigotagan. The alternative route options were identified based on technical understanding of the project area and initial input during meetings with some local communities in 2011, as well as avoiding bio-physical factors known to be in the region and across the boreal landscape. The SSEA process continued throughout 2012 and in latter 2012 a Final Preferred Route was identified. The details of the Project components are based on that Final Preferred Route.

The transmission line's design and construction will meet or exceed the requirements as set out in the Canadian Standards Association (CSA) as well as the North American Electric Reliability Corporation.

Structures

A guyed lattice steel structure is the current design. The height of the structure is engineered to be between 30 to 40 meters (m) with the footprint dimensions (guy wire base to guy wire base) being between 35 to 50 m. The spans between the structures will be approximately 420 to 480 m. This structure type, complete with relative dimensions, is illustrated in Figure 2-1.

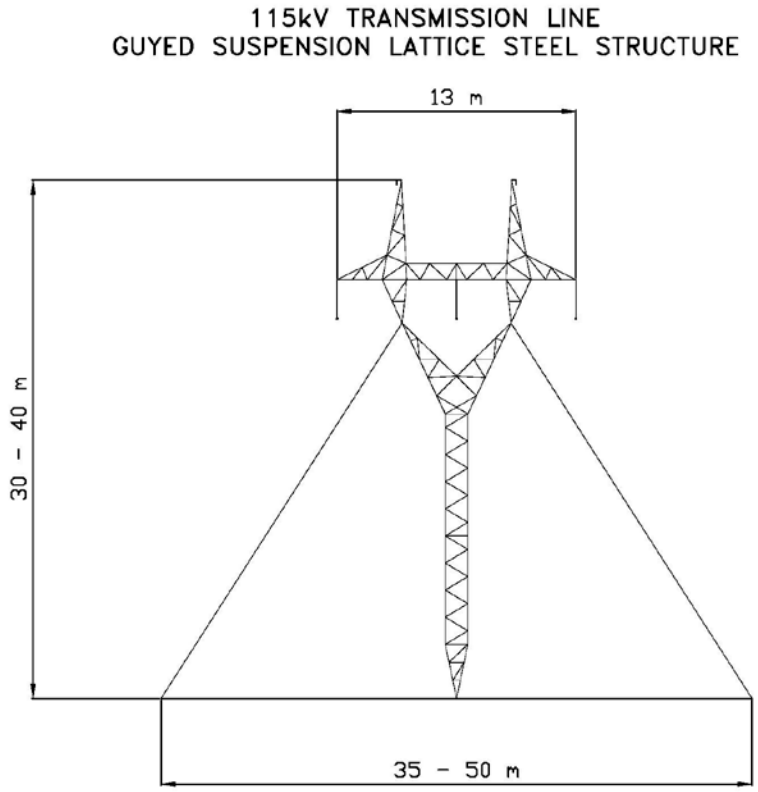


Figure 2-1: Guyed Lattice Steel Structure – Preliminary Design

Heavy angle and dead end structures will also be required at specific locations to accommodate line redirection and to terminate the transmission line into the Manigotagan Corner Station. Typical dead end and heavy angle structures will be a single circuit self- supporting steel lattice tower design. The heavy angle structure heights will be approximately 30 m and the bases will be about 14 x 14 m. The distance between the tower's centerline and outer arm edge will be between 8.5 and 9 m. This structure type is illustrated in Figure 2-2.

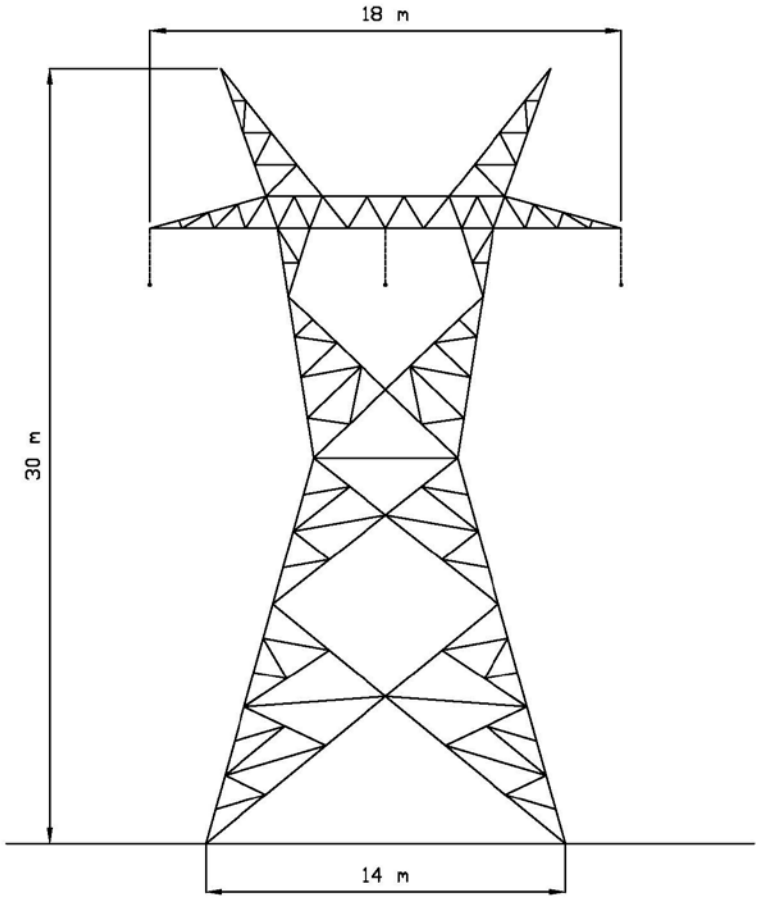


Figure 2-2: Heavy Angle Structure – Preliminary Design

Other structure designs might be considered to mitigate site specific issues along the final route alignment.

Conductors

Line PQ95 is designed for three 795 MCM 26/7 ACSR “Drake” type conductors, 28 millimetres (mm) in diameter, to be carried by the structures. Each conductor, consisting of aluminum strands with a center core of steel strands, will be supported from the structures by insulators. The ground-to-conductor heights will meet or exceed the C22.3 No. 1 “Overhead Systems” regulations. The minimum ground-to-conductor height under heavy loading conditions at 100 degrees Celsius (°C), as outlined by the CSA is provided in Table 2-1.

Table 2-1: Minimum Conductor to Ground Clearances

Condition	115 kV Alternating Current Line
Farmland	5.5 m / 18 ft
Roads, Highways, and Street Crossings	5.5 m / 18 ft
Underground Pipeline Crossings	5.5 m / 18 ft
Alongside Land Likely to be travelled by road vehicles	5.5 m / 18 ft
Over Land accessible only to pedestrians, snowmobiles, and ATVs	4.0 m / 13 ft

Due to difficulties in egressing from the Switchyard and challenges in spanning across the Winnipeg River, the use of underground and suspended cable for a small portion of line length is proposed. These conductors will be insulated according to CSA standards to allow for direct burial from the Switchyard into existing conductor cable trays located on the underside of the road located on the spillway side of the Pine Falls Generating Station (Figure 2-3). These conductors will be 1579 XLPE cable, 76.8 mm in diameter.

Insulators

Overhead transmission conductors will be insulated from the structures by sets of insulators. The insulators for this type of conductor are typically manufactured from ceramic and contain seven to nine bells per insulator. The insulators are suspended from the structures and support the conductors. The insulators have flexibility in movement to allow for blow-out and galloping of the conductor during various weather and electrical loading conditions.

Ground Wire

Two ground wires will be strung at the tops of the structures. These wires are designed to provide grounding and lightning protection. The ground wires are typically galvanized steel strands of conductors approximately 7 mm in diameter. One of these wires will be an Optical Ground Wire (OPGW). This OPGW cable will serve for communications purposes during the line's operation.

2.2.1.1 Transmission Line Right-of-Way Requirements

Manitoba Hydro obtains the legal right to construct, operate and maintain their transmission lines within a ROW. This right is generally obtained through easement of privately owned lands, or initially by Crown Land Reservation, pending easement, for right of use on provincial Crown Land.

Figure 2-3: Cable Trays (indicated by arrow) on the Underside of PR #304 at the Pine Falls Generating Station

Once the Environment Act Licence is obtained, property easements for the required ROW will be secured. For private lands, this process is typically completed by direct negotiation with the affected landowner.

The ROW widths are determined to allow safe conductor swing or blow-out and to limit radio interference. The ROW widths selected for various structure types will meet or exceed the requirements as established by the CSA for radio interference. The ROW width also provides adequate lateral distance under wind conditions to limit flashovers onto objects located near the edge of the ROW.

With the guyed lattice steel structure type currently being considered, a new (unencumbered) alignment through provincial Crown Lands will require approximately a 60 m ROW width. Figure 2-4 illustrates the ROW requirements for the guyed steel lattice structure in an unencumbered provincial Crown Lands environment.

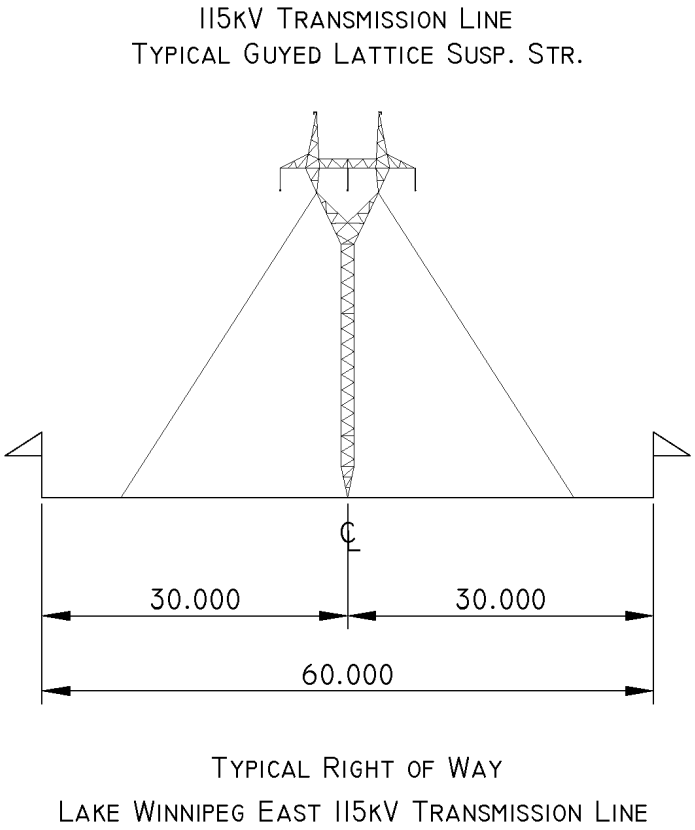


Figure 2-4: Guyed Structure Showing Typical ROW Requirements on Provincial Crown Land

2.2.2 Stations Components

2.2.2.1 Manigotagan Corner Station

Station Location and Size

Line PQ95 will be terminated at the new Manigotagan Corner Station. This station will be constructed as a 115-66 kV station, located south of PR #304 near the community of Manigotagan. A preferred site located to the west of the junction of PR #304 and the Rice River Road and approximately 5 km east of the Manigotagan community, has been identified. The site area is about 300 m x 194 m, of which approximately half (104 m x 104 m) will be developed for terminating Line PQ95 and sectionalizing 66 kV sub-transmission lines (Figure 2-5). These sub-transmission lines currently connect the Switchyard to both Bissett and Bloodvein sub-stations. The developed portion of the station will be contained within a chain link fence. The undeveloped portion of the site will remain available for future station expansion (Figure 2-5).

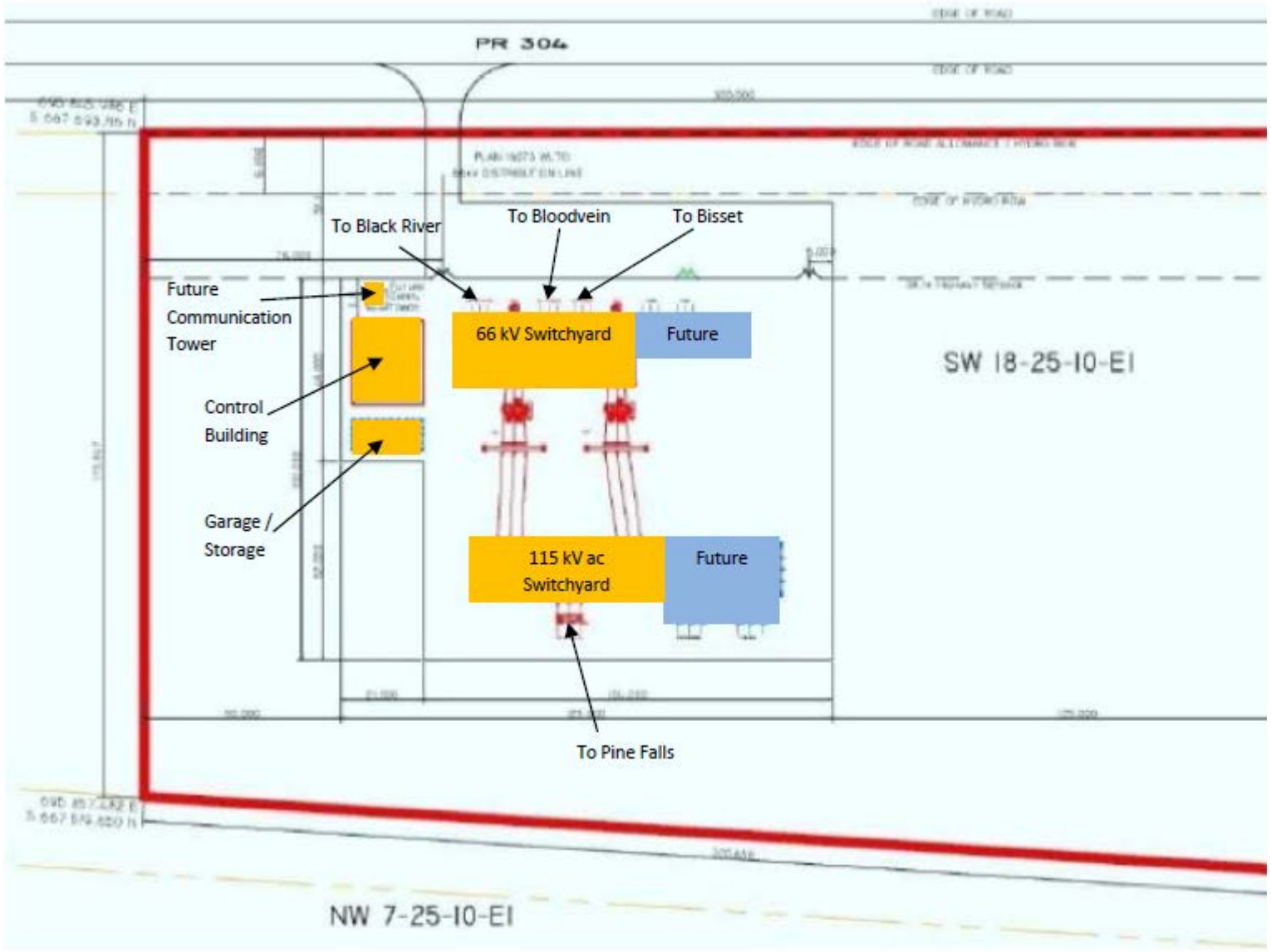


Figure 2-5: Footprint of Manigotagan Corner Station

Station equipment

Specific equipment for the Manigotagan Corner Station will be needed to accommodate the termination of Line PQ95, as well as the 66 kV sub-transmission lines. The major equipment components will include:

- two 115-66 kV three phase power transformers;
- two 115 kV breakers;
- various 115 kV switches, fuses and arresters;
- five 66 kV breakers;
- various 66 kV switches, fuses and arresters; and
- other associated components.

Station Site and Ground Improvement

The Manigotagan Corner Station will be typical of most other transmission stations of this type. The developed portion of the station will be topped with granular material. The perimeter of the station site will be designed for drainage from the station. A fence will contain the developed portion of the station site.

Station Structures

Associated with the required station equipment installations will be foundations needed to support the equipment and to allow the equipment to be connected to the existing 66 kV sub-transmission line sections. The associated structures will be steel lattice in design and will be supported on concrete foundations located inside the station site. A dead end lattice steel structure will be the last terminal point of the transmission line prior to connection to the station. This structure is generally located outside the fenced area of the station.

Station Buildings

The Manigotagan Corner Station will require a control building to be contained within the fenced area of the station. The building will be located in the northwest corner of the developed portion of the station and will house electrical equipment required for the continuous operation of the station. Building dimensions are planned to be approximately 18 m x 18 m. The current design for the building is steel clad.

In addition, a garage will be located on the station site, immediately to the south of the control, building. The purpose of the garage is to store maintenance equipment such as bucket trucks.

No communication towers will be constructed as part of this project, however provision for a future tower has been provided within the station site. The communications tower site is currently designed to be at the northwest corner of the station, immediately north of the control building.

Site Security

The station site will be enclosed within a single continuous perimeter fence, consisting of heavy, chain link fence. The height of the fence will be approximately 2.1 m, with a top guard of at least three strands of barbed wire extending to an overall height or approximately 2.4 m.

Station Grounding

The station will include a subsurface ground grid needed for personal and equipment safety, which will conform to Manitoba Hydro specifications for station design. The station ground grid will be placed under the insulating stone surface and will extend just beyond the perimeter fence. The subsurface ground grid at the site will consist of numerous copper clad steel ground rods (approximately three meters in length) extending into the ground and connected together below the surface with bare copper wire. Metal equipment and infrastructure at the station site such as the perimeter fence, steel structures, equipment structures and foundations, and transformers will be connected to the ground grid.

Oil and Oil Containment

Oils and gases are typically required to provide insulating medium for equipment within transmission stations. These are required for the safe operation of the station's equipment. The Manigotagan Corner Station will contain various quantities of mineral oils as well as insulating gases. Table 2-2 shows the proposed listing and quantities of oils and gases for the station.

Table 2-2: Mineral Oils and Insulating Gases for the Manigotagan Corner Station

Equipment	Development 2015	Total Volume of Mineral Oil	Total Volume of Insulating Gases		Total Volume of Dielectrol Fluid
			Total SF6 Gas	Total CF4 Gas	
Power Transformer (BK1), 115-66 kV Insulating Oil = 11,735 L (N36)	Quantity of 2 @ 11,735 L (N36)	23,470 L	Not Applicable	Not Applicable	Not Applicable
Circuit Breaker – 115 kV containing SF6=18.27 kg & CF4=10.75 kg	Quantity of 2	Not Applicable	36.54 kg	21.46 kg	Not Applicable
CVT = 115 kV 30 L (N35)m 7.7 L (PXE)	Quantity of 9	270 L	Not Applicable	Not Applicable	69.3 L
Ground Bank Transformer - 66 kV Insulating Oil=4,484 L (N36)	Quantity of 2	8, 968 L	Not Applicable	Not Applicable	Not Applicable
Circuit Breaker - 66 kV containing SF6 = 7 kg & CF4 = 4 kg	Quantity of 5	Not Applicable	35 kg	20 kg	Not Applicable
Estimated Totals		32,708 L	71.54 kg	41 kg	69.3 L

Note: kV = kiloVolt; L = litre; kg = kilogram

An oil containment plan for the Manigotagan Corner Station will be prepared and submitted to MCWS for approval. The final plan will be approved by a Professional Engineer. This oil containment plan will be subject to the environmental licence required for this project. Oil containment will be installed as per the requirements of the regulatory authorities and conditions of the environmental licence.

Access to the Station Site

Access to the station site during construction will be from PR #304. Once that station is completed, permanent all weather road access from PR #304 will allow for ongoing station maintenance. Present plans are for the station entrance to be built perpendicular to PR #304 onto the station site property.

The access road to the station is designed to have a 25 m approach from the PR #304 to allow for a turning radius for a 150 foot tractor trailer. The access road will be approximately 9 m in width. The road design will allow for the roadway portion to be elevated to allow proper drainage off the road. Culvert size will be determined by Manitoba Infrastructure and Transportation. Required culvert placement and road side maintenance for the entranceway will be completed as per permits required from Manitoba Infrastructure and Transportation.

Figure 2-5 illustrates the footprint of the proposed Manigotagan Corner Station needed to terminate Line PQ95 and to sectionalize the 66 kV sub-transmission lines. The ultimate property area is noted in red. The access road location to the station site is also identified.

2.2.3 Pine Falls Generating Station Switchyard

Line PQ95 is planned to egress from the north side of the Switchyard. All Switchyard equipment additions will be contained within the existing fenced area of that facility.

Additional Equipment

Additional equipment requirements needed to complete the connection of Line PQ95, include:

- one 115-66 kV transformer;
- one 66 kV breaker; and
- modifications to transformer and line protection.

Associated with the Switchyard equipment additions will be foundation installations needed to support the equipment and to allow the equipment to be connected to the existing Switchyard apparatus.

Figure 2-6 illustrates the area for equipment additions in the Switchyard.

Figure 2-6: Pine Falls Generating Station Switchyard (Note underdeveloped area adjacent to the right hand foreground outlined in red)

Site Security

The Switchyard is currently contained in a continuous, chain link-fenced enclosure. The fence has several barbed wire strands at the top of the fence for additional security. All new equipment additions will be located within this fenced area. All gates and other access points to the station will be locked.

Grounding

The existing grounding system which is currently used for this station will also be used for grounding the new equipment additions.

Oil and Oil Containment

The equipment additions for the Switchyard will require a modest amount of mineral oils and insulating gases for the proper operation of the power transformers and circuit breakers.

Table 2-3 itemizes the types and amount of oils and gases required for this additional equipment to terminate Line PQ95.

Table 2-3: Mineral Oils and Insulating Gases for Pine Falls Generating Station Switchyard

Equipment	Development 2015	Total Volume of Mineral Oil	Total Volume of Insulating Gases	
			Total SF6 Gas	Total CF4 Gas
66 kV Power transformers Insulating Oil = 341 L	Quantity of 3	1, 023 L	Not Applicable	Not Applicable
Circuit Breaker - 115 kV containing SF6 = 18.27 kg & CF4 = 10.73 kg	Quantity of 1	Not Applicable	18.27 kg	10.73 kg
Estimated Totals:		1, 023 L	18.27 kg	10.73 kg
Note: kV = kiloVolt; L = litre; kg = kilogram				

Site Access

The Switchyard is presently accessible by a permanent all-weather road access from PR #304. Existing access will be used for equipment placement at the station site. Minor temporary modifications might be required in and along the north side of the Switchyard for access by construction vehicles.

2.3 PROJECT CONSTRUCTION

2.3.1 Transmission Line PQ95 Construction

Transmission line construction will begin subsequent to receipt of the environmental licence as regulated by the *Manitoba Environment Act.* Other work permits and/or authorizations will also be obtained as required. It's expected that construction activities will be carried out by contractors, under the supervision of Manitoba Hydro. Both Manitoba Hydro field staff and the contractors will be provided with the environmental licence specific to this project, which will identify conditions to be applied and implemented during construction phases of development. In addition, Manitoba Hydro will adopt the standard procedures for protecting the environment by adhering to a Construction Phase EnvPP. The Construction Phase EnvPP will outline general and site-specific mitigation and on-ground activity for preventing or minimizing environmental effects as a result of construction activities associated with the transmission line's development.

Underground and suspended cable installation will be supervised and completed by qualified staff and certified trades people. The current design is for cable placement to be underground from the Switchyard to the Pine Falls Generating Station. The Switchyard and the generating station are both owned by Manitoba Hydro. Once at the Pine Falls Generating Station, an

existing cable tray which is located on the underside of the roadway across the generating station, will be used to house the cables. Once on the north side of the generating station, the cable will be the overhead portion of Line PQ95.

Overhead transmission line construction is preceded by a survey to establish the centerline of the ROW. The edges of the ROW will be flagged to ensure that tree clearing is completed according to CSA and North American Electric Reliability Corporation standards. The survey will also establish the specific locations of each transmission structure.

Right-of-Way Clearing

Clearing of trees and other vegetation within the ROW is required for transmission line operating safety and reliability. Herbicides will not be used for clearing the ROW. The extent and type of clearing method will be influenced by the transmission line route and the amount of vegetation to be cleared. Clearing methods can include machine clearing by “V” and KG shear blades, mulching by rotary drums, selective clearing by feller-bunchers and hand clearing particularly in environmentally sensitive areas. Trees will be cut close to ground level, typically within 10 centimetres (cm) (4 inches) above the ground surface. Ground vegetation will not be grubbed except at structure sites where foundations are required, where access of equipment necessitates it, or for worker safety reasons. In circumstances where danger trees beyond the ROW are identified, they will be targeted for removal.

The disposal of trees and other vegetation will conform to the recommendations as outlined in the Draft EnvPP (Appendix 1), in discussion with private property owners or to satisfy conditions of the project’s environmental licence. Where practical, Manitoba Hydro may set aside a limited quantity of non-marketable timber for use by local communities. The remaining debris/timber is expected to be disposed of by burning.

Once the ROW is cleared, construction of the transmission line will begin. Construction is generally as follows:

- installation of anchors and foundations (types may include rock sets, cast-in-place concrete piles, or pre-cast concrete screw piles);
- assembly and erection of structures;
- stringing of conductors and ground wires (including OPGW); and
- clean-up and commissioning.

Foundation Installation

Depending on soil conditions or sensitivity of the site, either mat, rock set, screw or pile foundations can be used. Mat foundations are typically 3 m (9.8 ft) x 3 m (9.8 ft) by 3 m (9.8 ft) deep. Where soil conditions permit, pile foundations are augured cast-in-place piles, generally about 0.9 m (3 ft) in diameter extending about 10 m (33 ft) deep. Heavy angle or dead end structures can also require mat or pile foundations, with mat foundations being about 4 m x 4 m (13 ft x 13 ft) mats constructed 3 m (9 ft) deep. Pile foundations for heavy or dead end

structures consist of four 1.2 m (4 ft) diameter concrete piles extending about 12 m (36 ft) deep. Dimensions are subject to detailed design and will vary according to specific ground conditions.

Structure and Conductor Installation

If the construction component is contracted, the contractor's method for structure framing or assembly, and erection will typically prevail. Structures are generally assembled on-site, or assembled in designated marshalling yards and transported to the construction site by truck. Insulators will be attached to the cross-arms of each structure prior to structure erection. Structures are erected by cranes. Anchors will be placed to secure the structures. Reels of conductor will typically be transported by truck to the construction site. The conductors will be suspended from the insulators which are attached to the structures. Conductor tensioning will be completed by machine to provide the pre-determined ground-to-conductor clearances. Either implosive sleeves or hydraulic crimping will be used to splice conductor ends together.

Equipment Requirements

Clearing and construction equipment types can include:

- feller-bunchers;
- skidders;
- bulldozers with shear blades, dozer blades and rakes;
- bulldozers with stringing equipment such as tensioners and pullers;
- drill rigs;
- backhoes with attachments;
- excavators and cranes;
- materials delivery trucks and trailers;
- concrete trucks; and
- various smaller equipment as required.

Access for Transmission Line Construction

Access for transmission line construction will generally be within the ROW. Access to the ROW will typically be from adjacent or intersecting roadways or existing trails. Permission will be requested from landowners for use of roads or trails on private property. Permits will be secured from MCWS for access to the ROW from provincial Crown Lands. Manitoba Infrastructure and Transportation will be contacted for access from existing highways such as PR #304.

Use of existing access further reduces the need for additional construction trail development and minimizes corresponding environmental disruption.

Marshalling Yards

Marshalling yards are used for storage of construction materials and equipment, and possible assembly of towers. These yards will be established near the transmission line route and where practical, will take advantage of previously cleared sites such as borrow pits, aggregate stockpile site and wood yards. The number and location of the marshaling yards will be determined once the final route has been licensed. Contractor specifications and agreements will also influence the number and location of marshaling yards to be used.

Granular Materials

A limited amount of granular materials will be required during the construction of the transmission line for concrete batching and/or for granular backfill. Granular materials required for construction will generally be purchased from local suppliers. Locations and sites will be determined based on availability, quality of product, and location of the final licensed route. It is expected that the use of local granular materials will minimize the introduction of non-native and/or invasive plant species.

Waste Disposal and Clean-up

Disposal of waste materials will rely on the use of locally available services and will also be determined by conditions of the environmental licence. Temporary waste disposal will be undertaken in accordance with provincial and municipal regulations and by-laws. Once the transmission line is constructed, all excess materials and equipment including debris, and unused supplies will be dismantled if required, removed from the site and disposed of according to provincial and municipal regulations. Rehabilitation of sites such as marshaling yards will be undertaken as required.

Workforce Schedule and Accommodation Requirements

The installation of underground and cable tray conductors from the Switchyard can be conducted at any time of the year. This phase of development is scheduled to be completed in the months on June, July and August of 2014. Anticipated workforce employment for the installation of the underground and suspended portion of Line PQ95 is 23 for each of these months. A total of 69 person months of construction is anticipated for the cable installation portion of Line PQ95.

Overhead transmission line construction workforce will range in number from about 13 on a monthly basis, during mobilize and de-mobilize phases, to a maximum of 112 personnel per month during peak construction periods. The overhead line construction will be conducted during winter months only, extending from December, 2013, to the end of April, 2015. ROW clearing will commence in December 2013 and be completed by April 2014. A total of 154 person months of activity is expected in this first winter season of clearing and construction. The second winter season from November 2014 to April 2015 will focus on overhead line construction and will involve an estimated 365 person months of activity to complete line construction.

It is expected that local existing accommodations will be used for the most part for housing the transmission construction workforce when working at the southern portion of the project area. Powerview-Pine Falls community has several rental accommodations which might be available. When working at the northern part of the transmission project area, accommodations for transmission line construction personnel working will either be used at nearby communities, in mobile work camps or commuting from accommodations available at Powerview-Pine Falls and neighboring areas.

2.3.2 Stations Construction

2.3.2.1 Pine Falls Generating Station Switchyard

Equipment Additions to Pine Falls Generating Station Switchyard

All modifications and equipment additions will be conducted within Manitoba Hydro's existing property as well as within the fenced area of the Switchyard. For the most part, Switchyard construction activities will be carried out by skilled and certified trades people.

Access to the Switchyard Site

As public and worker safety, as well as station security, are of utmost importance, only authorized personnel will be allowed within the Switchyard construction area. The Switchyard is located immediately south of the Pine Falls Generating Station and adjacent to the east side of PR #304. Access to the Switchyard by construction and maintenance vehicles will be from PR #304 or nearby roadways. It's anticipated that no new access will be required for the equipment additions at this Switchyard. Minor upgrades may be required at the north end of the Switchyard site to accommodate vehicle access to the immediate area inside the fence where Switchyard equipment will be installed.

Workforce and Accommodations Requirements

The expected construction workforce for the Pine Falls Switchyard equipment additions is about 44 person months of construction activity over the eleven month period from October 2014, to September 2015. . This includes an estimated 13 workers over 1.5 months during May through June, 2013 for civil construction; 4 journeymen electricians to complete the electrical works from April through July, 2015 and also to salvage potential transformer in mid-September, 2015; 10 persons from latter March to mid April 2015 to complete structure installations and equipment stands.

For the Switchyard upgrade component, it's anticipated that the workforce accommodations will be available at existing establishments within the Powerview-Pine Falls community or nearby communities. No mobile work camp accommodations are expected to be needed.

2.3.2.2 Manigotagan Corner Station

Station Construction

The new Manigotagan Corner Station will be accessible only to authorized personnel. For the new Manigotagan Corner Station, the following construction activities are anticipated, subsequent to the receipt of the environmental licence.

The property site for the station will be surveyed and secured or purchased from the Crown. The ultimate property requirements will be purchased (300 m x 194 m), though at this point, only about half will be fully developed. Once the property is acquired, cleared, and fenced foundations will be installed for the various pieces of equipment, including those for three bays of 115 kV steel structures, and for 115 kV switches (3), 115 kV breakers (2), 66-115 kV transformers (2), nine bays of 66 kV structures, and several 66 kV breaker switch stands, breakers, and Current Transformers. Risers will then be installed, followed by grounding installation for the station fence, yard, structures and related equipment. Site improvements will then be completed for the station area to be developed (94 m x 105 m). Access road development will be completed and steel structures for supporting the equipment will then be installed, followed by the installation of the major pieces of equipment and station services. The alternating current supply for the transformer bank and structure lighting will then be installed. The control building, estimated to be about 18 m x 18 m will then be constructed or assembled and installed, followed by installation of control and station protection systems. Once the station is complete, testing and commissioning will be undertaken as the final step.

Workforce and Accommodations Requirements

Construction workforce for the Manigotagan Corner Station will range in number from seven people for a period of two months during station site clearing, to about 24 people per month for several months during foundation and building stages of the development. The workforce will not be restricted by frozen ground conditions and work will occur in most months of the year. The Manigotagan Corner Station construction workforce estimates include:

- 14 person months in March and April 2013 for site clearing;
- 56 person months for site improvement in August through November 2103;
- 78 person months for foundations from August through November 2014;
- 67 person months for building from December 2014 through April 2015;
- 24 person months for final site preparation in May and June, 2015; and
- 81 person months for electrical work from May to July and 48 person months from August to October, 2015.

There is an estimated 368-person months of construction workforce employment for this project component.

It's anticipated that most workers will commute on a daily basis from communities offering existing available accommodations. Powerview-Pine Falls is the likely location for accommodations. If existing accommodation are not available, mobile work camp accommodations may be required.

2.4 OPERATION AND MAINTENANCE

2.4.1 Transmission Line

Line PQ95 will be designed to operate continuously, though the actual flow of electricity will vary with electrical load requirements. In order to maintain Line PQ95 in a safe and reliable operating condition, regular inspection and maintenance must occur. This will include inspections of the ROW as well as structures, conductors and related hardware.

The inspections of the transmission line will include air patrols, ground patrols and non-scheduled maintenance by air or ground in the event that unexpected repairs are required. Ground travel can include snowmobile, flex-track type or road vehicles. Regular inspections will typically occur once per year by ground and can occur up to three times per year by air.

Maintenance procedures are the subject of a continuously updated corporate manual for transmission line maintenance and construction activity.

Vegetation Management and Weed Control:

Vegetation management within the ROW is required for human safety as well as the reliable operation of the line. The ROW will be maintained on an ongoing basis throughout the life cycle of operation.

An integrated vegetation management approach will be undertaken to address non-desirable and non-compatible vegetation issues within the ROW. To achieve this, a variety of possible vegetation management methods are available, including mechanical, chemical and biological control techniques within reasonable costs and minimal environmental impacts.

Options for vegetation management in the ROW include:

- Hand cutting: Where local conditions and factors permit, hand-cut deciduous trees might be stump treated with an approved herbicide to prevent regrowth. Hand cut trees (using chainsaws, brushsaws, axes and brush hooks) that do not receive stump treatment will require follow-up maintenance to address regrowth;
- Mechanical Cutting: where dense tree growth reoccurs on the ROW, mechanical cutting is generally undertaken. This type of ROW maintenance typically requires follow-up maintenance within two to three years to manage suckering of deciduous trees;
- Winter Shearing: This type of ROW maintenance is used in frozen ground conditions where a tracked vehicle equipped with "V" or "KG" blade is used to clear tree growth in excess of

2.5 cm in diameter. The tree growth is sheared just above ground level (frost line) to minimize environmental damage and disturbance to the organic soil layer;

- Herbicide Treatment: This method is used to control and reduce tree growth problems on a long term basis and as a follow-up action to previous vegetation management work. All herbicide applications will be completed and supervised by licensed applicators and in accordance with a Pesticide Use Permit. Herbicide application rates will be determined by Manitoba Hydro's Chief Forester in accordance with product label instructions. Only herbicides which have been identified in the Herbicide Use Permit will be used.

Broadcast stem application equipment such as machine applicators and hose and handgun applicators are used for controlled droplet applicators for tree heights of 2.5 cm or less. Selective stem applicators such as hose and gun sprayers are the preferred method of application for trees under 2.5 cm diameter.

Basal treatment applications are used for a direct spray onto the lower 20 cm of the tree stem or root collar. This can be completed in any season and is generally used for tree growth over 2.5 m in tree height. Stump treatment is used following hand cutting whenever practical, in order to provide selective control of suckering for deciduous tree species and to minimize effects on desirable species. Tree injection methods might also be used on trees over 2.5 meters in height, subject to aesthetic impact considerations;

- Biological Control is a method of encouraging competing plant species, planting and maintaining desirable plant species, encouraging specific wildlife use or encouraging secondary use of the ROW to control the spread of unwanted species.

On private lands, weed control in cultivated and uncultivated areas of the ROW involves the input of the landowner as well as Manitoba Hydro personnel. Prior to any vegetation management work on private property, the appropriate landowner or authority will be contacted. On provincial Crown Lands, a work permit will be obtained under the *Manitoba Forest Act*. In cases where private property is adjacent to provincial Crown Lands, adjacent landowners will also be contacted in advance of the work. Manitoba Hydro's Chief Forester will coordinate the required approvals and is responsible for obtaining the necessary Pesticide Use Permits and submitting Post Season Control Reports as required by the Manitoba Regulation 94-88R under the *Manitoba Environment Act*.

The Operations and Maintenance phase of this project will be compliant with Manitoba Hydro's Operation Phase EnvPP.

2.4.2 Station Maintenance

Neither the transmission station nor Switchyard will be manned on a continual basis, however routine inspections and maintenance operations will be required to ensure safe and reliable operation. Weed control within station and Switchyard is necessary for operating reliability of equipment as well as safety of personnel working within the stations. Weed control within the

modified portions of the Switchyard and maintenance of the equipment additions will be implemented as part of the ongoing maintenance activities for that station. Maintenance of the Manigotagan Corner Station will be undertaken in a similar fashion to that of the Switchyard.

The Operations and Maintenance phase of this project will be compliant with Manitoba Hydro's Operation EnvPP.

2.5 PROJECT DECOMMISSIONING

It's expected that all project components will remain in service for several decades. If and when decommissioning of the transmission line, Switchyard or Manigotagan Corner Station is required, and a Decommissioning EnvPP will be developed to ensure compliance with the federal, provincial and municipal regulations of that time.

2.6 PROJECT SCHEDULE

Receipt of an Environment Act Licence for the LWESI Transmission Project is targeted for March 2013. Upon receipt of the environmental licence, property acquisition for the Manigotagan Corner Station and the Line PQ95 ROW will be completed.

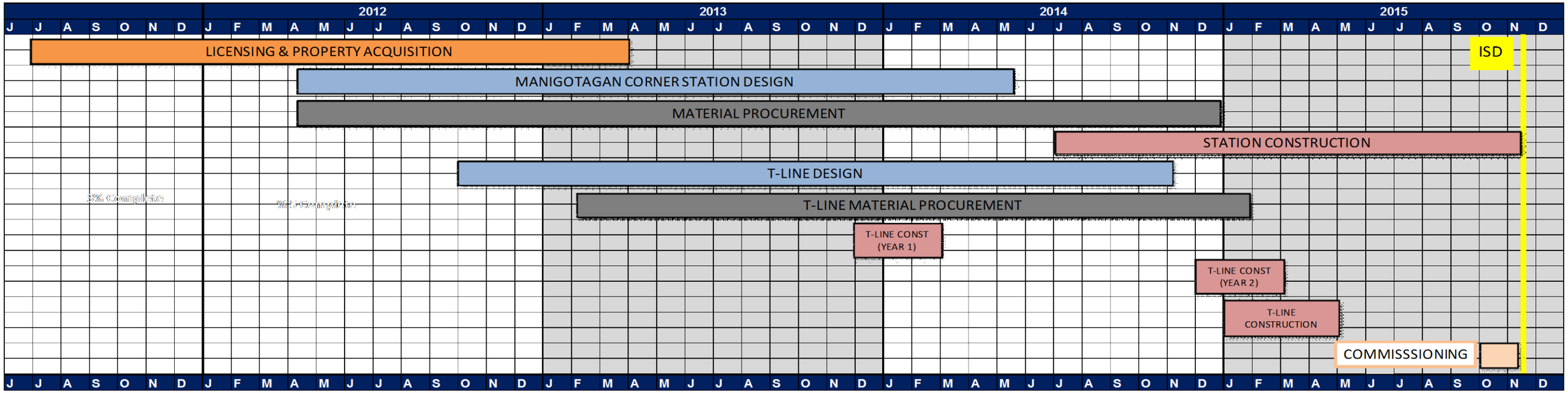
The project's construction schedule will occur through a period of three years from 2013 to 2015 inclusive. The transmission line ROW clearing and overhead line construction activity will be undertaken during the winter months under frozen ground conditions. Clearing of the ROW for the overhead portion of the line will begin in December 2013, and is expected to be complete by the end of April 2014. This period will also include some construction activity. The construction of the overhead portion of line will resume in December 2014 and be complete by the end of April 2015. Transmission line construction as well as demobilization, is expected to be complete, by the end of April 2015. The underground and suspended portion of line that extends from the Switchyard along the underside of the road on the Pine Falls Generating Station is scheduled to occur between June 2014, and August 2014. The transmission line is scheduled for commissioning and in-service in November 2015.

The Manigotagan Corner station will begin with site preparation in March and April 2013. Site improvement and fence construction will extend from August 2013 through November of 2013. Foundations, buildings and final site surface will be undertaken from August 2014 through May 2015. The station will be tested, commissioned and in-service for November 2015.

The equipment additions at the Pine Falls Generating Station will begin in November 2014 and be complete by the end of September 2015. Commissioning and in-service is targeted for November 2015.

Table 2-4 provides an overview of construction activities for each project component.

Table 2-4: Proposed Lake Winnipeg East System Improvement Project Schedule



3.0 SITE SELECTION AND ENVIRONMENTAL ASSESSMENT

3.1 BACKGROUND AND PURPOSE

Manitoba Hydro uses a Site Selection and Environmental Assessment process to plan and assess new transmission infrastructure. The overarching objective in the SSEA approach is to provide effects avoidance and management opportunities at every stage in the process, from planning through post-construction and operations. The SSEA process for the LWESI the Project is consistent with provincial and federal environmental assessment legislation, guidelines, and procedures, as well as industry best practices.

The SSEA process to select a route for the transmission line considered a broad range of environmental, socio-economic, and stakeholder involvement information to systematically refine and reduce the route alternatives to the single best balanced choice of a preferred route. Throughout this process, the specific objectives of the transmission line SSEA process were to:

- select a transmission line route in a technically, economically, and environmentally sound manner;
- assess the potential impacts of the Project;
- conduct the SSEA process with consideration of inputs from landowners, resource users, interest groups, resource managers, and the public at large in a responsive, documented, and accountable manner;
- find practical ways to reduce potential adverse effects and enhance benefits; and
- prepare an EA Report which documents the results of the SSEA study.

3.2 SSEA METHODS

Manitoba Hydro attempts to balance ROW site selection for a transmission line project using biophysical, socio-economic, technical (engineering) and cost considerations through the SSEA process. Manitoba Hydro seeks to avoid adverse environmental effects and enhance potential benefits whenever possible and practical. Where project effects cannot be avoided, routes are selected that best lend themselves to effective mitigation and sound management for limiting potential effects to the environment and stakeholders. This general approach is consistent with Manitoba Hydro's policies on Sustainable Development (Section 8.7). The SSEA (outlined in Figure 3-1) was comprised of four key areas of activities:

- route selection studies;
- biophysical and socio-economic studies;
- stakeholder and Aboriginal involvement; and

- government involvement.

The key areas of activities were conducted concurrently so that information and results generated in each key area of activity could be used to provide feedback to guide the development of the other key areas of activity.

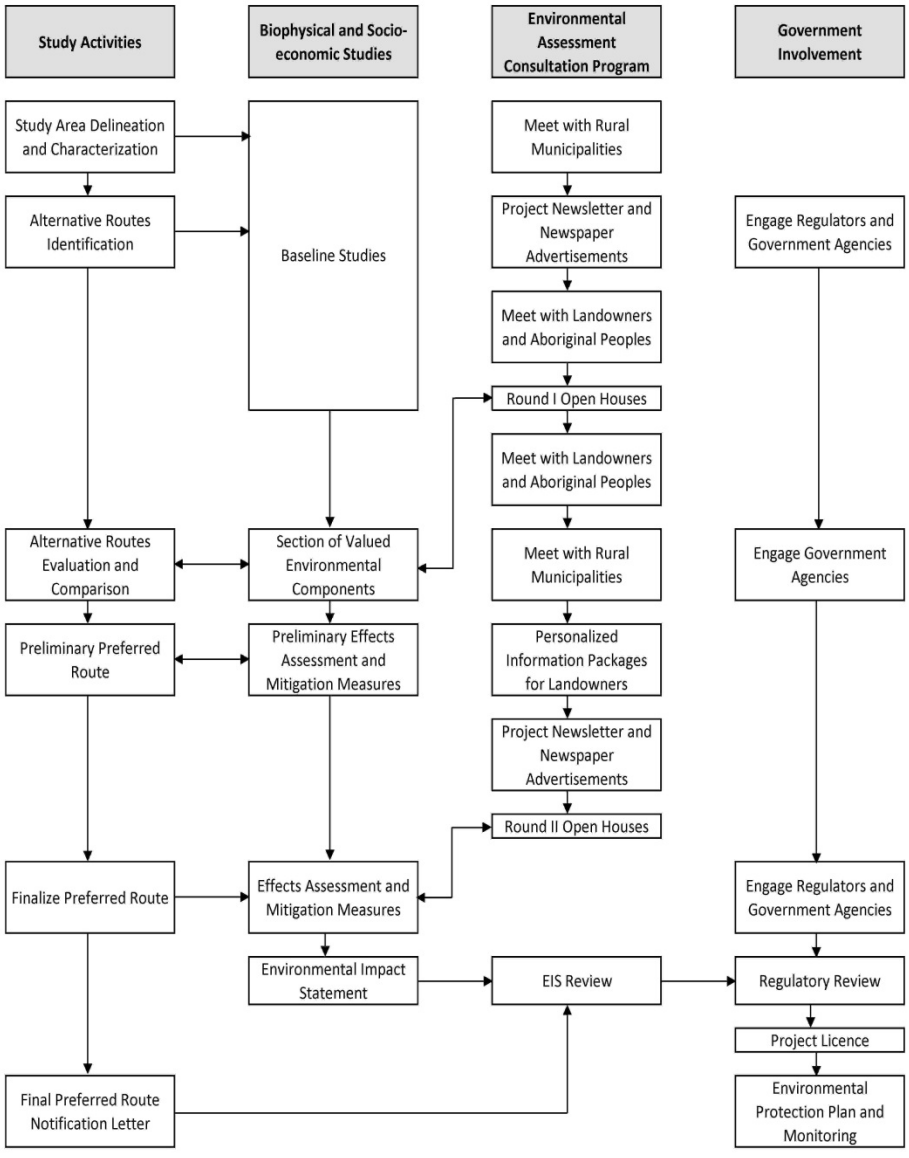


Figure 3-1: Site Selection and Environmental Assessment Process

3.2.1 Route Selection Studies

3.2.1.1 Project Study Area

The first step in the SSEA process was to define the Project Study Area. An initial Project Study Area was selected in 2011. This initial Project Study Area was refined in 2012 based on modifications to the three Alternative Routes which brought them in closer alignment with PR #304. The revised Project Study Area contained the three Alternate Routes, the Project footprint (including the new Manigotagan Corner Station Site), and was of sufficient size to assess any potential project effects on biophysical and socio-economic components (Map 3-1). The Project footprint included the Final Preferred Route, a 60 m wide ROW centered on the line

The next step involved characterizing the Project Study Area to describe existing conditions, both biophysical and socio-economic. Information was updated and refined throughout the SSEA process, which involved document and data review, field studies, stakeholder meetings, open houses and liaison with government agencies.

The Project Study Area included the following communities (from south to north):

- the Hamlet of Silver Falls;
- the Hamlet of St-Georges;
- the Town of Powerview-Pine Falls;
- Sagkeeng First Nation;
- Black River First Nation;
- the Northern Affairs Community of Manigotagan;
- Hollow Water First Nation;
- the Northern Affairs Community of Seymourville; and
- the Northern Affairs Community of Aghaming.

Approximately 40 km east of Manigotagan is the Northern Affairs Community of Bissett which was considered in the socio-economic effects assessment because of mine development in the area.

Biophysical and socio-economic components of the Project Study Area were characterized through assessment of existing data, and augmented through field studies, Aboriginal Traditional Knowledge (ATK) workshops and key person interviews. This information was used to provide the context for selection and identification of the Preferred Route.

3.2.1.2 Evaluation of Alternative Routes and Station Site

A three phased approach was used to identify, evaluate and compare alternative routes for the Pine Falls–Manigotagan Line PQ95. During each phase, updated and more detailed biophysical, socio-economic, and stakeholder information was incorporated into the route selection process. The Line PQ95 Preferred Route was selected by a multi-step process within the context of the SSEA approach developed by Manitoba Hydro. The route selection process used regional and site-specific biophysical and socio-economic information as well as cost and technical factors to identify the alternative routes. Proxies for cost were used to aid in route selection. The approach assessed alternative routes in a systematic manner to ultimately result in a Final Preferred Route.

Phase I began in mid-2011 by identifying a Project Study Area and preliminary alternative routes, and requesting initial public input on the routes. In Phase II, the preliminary alternate routes were refined, and further public input was sought through the Public Engagement Program. This phase, which was undertaken throughout 2012, compared and evaluated viable alternative routes and identified a preliminary preferred route.

The new 115-66 kV Manigotagan Corner Station Site will be the termination point of Line PQ95. A combination of technical and environmental criteria was considered for the comparison of station site options. Cost was also integrated into the site selection process. Four potential station sites were identified in the Project Study Area.

A more detailed description of the process of selecting and evaluating the alternative routes and station site is provided in Chapter 6.0.

3.2.1.3 Selection of the Preferred Route and Station Site

In Phase III of the route selection process, the Preferred Route was optimized to identify the Final Preferred Route. The Final Preferred Route selected is technically feasible, environmentally favourable and socially acceptable.

The preferred Manigotagan Corner Station Site was determined evaluating technical and environmental criteria. The preferred station site was shared with local communities as part of the PEP.

A more detailed description of the process to select the Final Preferred Route and Station Site is provided in Chapter 6.0.

3.2.2 Biophysical and Socio-economic Studies

3.2.2.1 Baseline Studies

Baseline studies were conducted for the following disciplines:

- physical environment (climate, soils and geology);
- aquatic environment;

- terrestrial environment (vegetation, forestry and wildlife); and
- socio-economic environment (land and resource use, economy, heritage resources and cultural resources).

These studies involved reviewing existing information [primary literature, government and consultant reports, and unpublished data (e.g., Manitoba Conservation Data Centre [MBCDC] records, Forest Resource Inventory data). For some disciplines (e.g., aquatics, vegetation, wildlife, heritage resources), field studies were undertaken to further characterize the Project Study Area.

The results of these baseline studies are provided in a series of Technical Reports which are summarized in Chapter 4.0.

3.2.2.2 Selection of Valued Environmental Components

The environmental assessment was focused on Valued Environmental Components (VECs), which are those aspects of the natural and socio-economic environment that are particularly notable or valued because of their ecological, scientific, resource, socio-economic, cultural, health, aesthetic, or spiritual importance, and which have a potential to be adversely affected by project development or have the potential to have an effect on the project. Hence, a VEC must both be important and have the potential to be affected by, or to affect, the Project. The potential to be affected means there has to be some interaction, either directly or indirectly, between the environmental component and some component or activity associated with the project during planning, construction, or operation. In this way, the assessment was focused on the identification and management of potential adverse effects.

A biophysical VEC can be a particular habitat, an environmental feature, a particular assemblage (community) of plants or animals, a particular species of plant or animal, or an indicator of environmental health. Biophysical VECs were defined on the basis of their meeting one or more of the following criteria:

- area of notable biological diversity;
- significant habitat for locally important species;
- significant habitat for uncommon or rare species;
- important corridor or linkage for fish and/or wildlife movement;
- sensitive receiving water environment;
- species at risk;
- notable species or species groups;
- indicator of environmental health;
- important component to the function of other ecosystem elements or functions;

- component is of economic or cultural significance;
- component is of educational, scientific, or aesthetic interest; and
- component is of provincial, national or international significance.

The VECs assessed in the effects analysis were defined by the multi-disciplinary project team undertaking the assessment based on:

- identified regulatory requirements;
- consultation with regulatory authorities;
- information derived from published and unpublished date sources;
- information and comment received during the engagement of local communities;
- feedback through the PEP; and
- biophysical and heritage assessment field surveys.

A workshop was held with the discipline experts to identify VECs for the Project. Using the criteria above, and seeking to balance biophysical and socio-economic criteria. A preliminary list of VECs was proposed based on selected baseline information collected in 2011. This list was reviewed and revised based on the selection criteria (above) and further knowledge of the area. Consideration was also given to the following factors:

- seeking a balance between biophysical and socio-economic VECs; and
- consideration of VECs representing both potential positive and negative effects of the Project.

Based on these criteria, a total of 22 VECs were selected. Of these, 11 representing biophysical aspects, including individual species, habitats and habitat characteristics were chosen. Table 3-1 summarizes the biophysical VECs by discipline, and the rationale for their selection. Eleven VECs were selected representing socio-economic elements, including economics, personal well-being, cultural and heritage resources, and land and resource use. Table 3-2 summarizes the socio-economic VECs by discipline, and the rationale for their selection. These VECs are addressed in Chapter 7.0.

Table 3-1: Summary of Biophysical Valued Environmental Components

Discipline	Valued Ecosystem Component	Rationale
Aquatic	1. Fish habitat	As defined under the *Fisheries Act*; Legislated responsibility under federal *Fisheries Act* [harmful alteration, disruption or destruction (HADD], introduction of deleterious substances)
Vegetation	2. Bog club moss	Species of Conservation Concern (S1)
	3. Hooker`s orchid	Species of Conservation Concern (S2)
	4. Rattlesnake checkered plantain	Species of Conservation Concern (S2)
	5. Green ash/American elm forest	Rare deciduous forest type which provides habitat for a few uncommon species (S3)
Wildlife	6. Moose	Important big game species for harvest; Cultural concern; High conservation concern for regional population in decline; Regulatory concern; Indicator of edge, shrubland and forest habitat
	7. American martin	Important domestic and commercial furbearer species for trapping; Scientific concern (related to movement across ROW) ; Regulatory concern (trapping); Indicator of mature coniferous forest
	8. Canada warbler	Species of Conservation Concern (Provincially Endangered, Federally Threatened); Regulatory concern; Indicator of mature deciduous forest
	9. Olive-sided flycatcher	Species of Conservation Concern (Federally Threatened); Regulatory concern; Indicator of sparsely treed wetlands, burns and snags
	10. Bald eagle	Species of cultural concern; scientific concern for bird-wire collisions; Regulatory concern; Indicator of mature riparian forest
	11. Spruce grouse	Important upland game species for harvest; Regulatory concern; Indicator of mature conifer-dominated boreal forest

Table 3-2: Summary of Socio-economic Valued Environmental Components

Discipline	Valued Ecosystem Component	Rationale
Socio-economics	1. Population, Infrastructure, and Services	Increased population during construction may affect local infrastructure and services through increased demand or pressure.
	2. Employment and Economy	The Project has the potential to short-term create jobs and other economic opportunities in the Project Study Area.
	3. Personal Well Being	The Project may alter aesthetics of the area, may have nuisance effects during construction, and may have perceived impacts on human health.
Culture and Heritage Resources	4. Heritage resources	Legislated responsibility under the *Heritage Resources Act* (1986)
	5. Cultural Resources	Recommended standards related to traditional land use: Canadian Environmental Assessment Agency and United Nations Educational, Scientific and Cultural Organization
Land/ Resource Use	6. Land Ownership and Tenure	The Project crosses both private and Crown land and has the potential to affect commercial and residential land use during and after construction. .
	7. Commercial and domestically harvested plants	Species of cultural, medicinal and/or economic importance.
	8. Resource Use	Aboriginal communities in the Study Area rely on natural resources in the area for livelihoods.
	9. Recreation and Tourism	The Project Study Area includes lodges, outfitters, cottage subdivisions and recreation areas and facilities that could be affected by the Project.
	10. Productive forest land	Productive forestland forms the basis for all forest management planning
	11. High value forest sites	Substantial capital investment; Long-term monitoring and data collection; Private land values

3.2.2.3 Effects Assessment and Mitigation Measures

The environmental effects of the Project were identified, predicted or assessed using a stepwise approach. Firstly, potential effects of the Project were identified and the interaction between the Project and each biophysical or socio-economic component were characterized. Although a range of components were considered, the focus was on selected VECs. The assessment included consideration of direct and indirect, as well as cumulative effects. Both positive and negative effects were considered.

Identification of Mitigation Measures

When effects could not be avoided during the route selection process, mitigation measures were identified and incorporated into the Project design. These mitigation measures were based on Manitoba Hydro's best practices for pre-construction, construction, operation and maintenance phases of the Project.

Implementation of mitigation measures are detailed in the Environmental Protection, Follow-up and Monitoring (Chapter 8.0). General mitigation measures for the construction and operation phases of the Project are detailed in the Draft EnvPP (Appendix 1).

Residual Effects and Significance Evaluation

For any effects that could not be fully mitigated (i.e., residual effects), the significance of each effect was assessed. The following criteria were used to assess the residual effects from the Project: direction, magnitude, geographic extent, duration, reversibility, frequency and likelihood. Table 3-3 provides a definition for each of these criteria. Although the focus was on the VECs selected for the Project, consideration was also given to other key components in the residual effects and significance evaluation process.

Table 3-3: Assessment Factors and Criteria Used to Evaluate Significance of Residual Effects

Assessment Factor	Definition	Criteria	Significance Evaluation
Direction	Indicates whether the effect on the environment is positive, negative, or neutral.	Positive	Beneficial or desirable change
		Negative	Adverse or undesirable change
		Neutral	No detectable or measurable change
Magnitude	A measure of the intensity of an effect, or the degree of change caused by the Project relative to baseline conditions or guideline values. The scales of magnitude are defined for each VEC and relate to relative (percent [%]) or absolute changes above or below baseline, or threshold values.	Negligible	No detectable or measurable effect
		Small	Effect does not exceed baseline values, or guidelines, or within the natural range of variablility
		Moderate	Measurable effect that results in a short-term change, or meets and may occasionally exceed guidelines
		Large	Effect sufficient to cause a change that

Table 3-3: Assessment Factors and Criteria Used to Evaluate Significance of Residual Effects

Assessment Factor	Definition	Criteria	Significance Evaluation
			exceeds baseline values or guidelines
Geographic Extent	Refers to the area affected, and is categorized into three scales of local, regional, and beyond regional. Local-scale effects mostly represent changes that are directly related to the Project footprint and activities, but may also include small-scale indirect effects.	Project Footprint	Effects confined to the project footprint, including ROW
		Local	Direct and indirect effects that may extend beyond the project footprint, , generally with Project Study Area
		Regional	Direct and indirect effects that extend beyond local effects; may include cumulative changes from other projects;
Duration	The amount of time (usually in years) from the beginning of an effect to when the effect on a VEC is reversed, and is expressed relative to Project phases	Short-term	Effect that occurs during site preparation and/or construction phases of the project (i.e., one to five years)
		Medium-term	Effect that extends throughout the construction and operation phases of the project (i.e., up to 50 years)
		Long-term	Effect extends more than 50 years
Reversibility	After removal of the stressor, reversibility is the likelihood and time required for the Project to no longer influence the VEC or system. For socio-economic VECs, the manageability of effects is considered rather than reversibility.	Reversible	Effect is reversible during the life of the project
		Permanent	Long term permanent effect
Frequency	How often an effect will occur.	Infrequent	Effect may occur once during the life of the project
		Sporadic/ Periodic	Effect may occur without predictable pattern during the life of the project
		Regular/ Continuous	Effect may occur periodically or continuously during the life of the project

To determine the overall significance of a given residual effect, consideration was given to the significance evaluation for multiple criteria. Any effect that was considered neutral in direction was not considered in the residual effects assessment. Effects that were considered negligible

in magnitude were also excluded. For other effects, the magnitude, duration and geographic extent were considered in concert to determine whether a residual effect was considered significant. Table 3-4 below indicates the potential significance of short- and medium-term effects (duration). Table 3-5 indicates the potential significance of long-term effects.

Table 3-4: Significance Assessment for Effects of Short and Medium Term Duration

Magnitude	Geographic Extent		
	Project Footprint	Local	Regional
Large			
Moderate			
Small			

Note: Grey shading indicates effects considered significant.

Table 3-5: Significance Assessment for Effects of Long Term Duration

Magnitude	Geographic Extent		
	Project Footprint	Local	Regional
Large			
Moderate			
Small			

Note: Grey shading indicates effects considered significant.

Effects that were considered significant according to the above criteria were further evaluated based on the reversibility and expected frequency. Reversible effects were considered not significant. Effects that were sporadic, unlikely or had a high degree of uncertainty were alsoconsidered not significant.

There is a level of uncertainty about the nature of predicted effects, and the level of uncertainty varies depending upon the effect in question. Some effects are predictable with a high level of certainty, while other effects may not even be known before they occur. To address this uncertainty, proposed monitoring and follow-up activities will be undertaken to determine the nature and extent of Project effects. These activities are discussed in more detail within the Technical Reports, and summarized in Chapter 7.0.

3.2.3 Stakeholder Involvement

Public engagement was conducted throughout the planning process to gain input from a variety of stakeholders, including individuals, communities, and interested stakeholder groups. Manitoba Hydro developed a two-round PEP to provide the public, in particular those who may be directly or indirectly affected by the Project, with meaningful opportunities to receive information on, and provide their input into the SSEA process. In particular, the PEP sought to fill gaps in scientific knowledge through the collection of ATK and local knowledge from people engaged on the land. Public input was key in the identification of a Final Preferred Route.

The PEP involved holding two rounds of open houses, distributing print materials (letters, newsletters, maps), meetings with interested stakeholders, a series of key person interviews (KPI) and several ATK workshops. Details regarding the PEP plan, methods and outcomes are summarized in Chapter 5.0.

3.2.4 Government Involvement

Provincial and federal permitting and environmental assessment requirements were reviewed at the outset of the SSEA process to develop a framework for the Project. Meetings with the Environmental Approvals Branch of MCWS were held to review the proposed project and SSEA approach. Various federal, provincial and municipal government agencies were consulted throughout the SSEA process to request relevant data, solicit input, and identify any proposed projects and initiatives which could interact with the Project. Information and input gathered from government agencies was used to assist in the selection of alternative routes and assess potential cumulative effects.

3.3 ENVIRONMENTAL PROTECTION PROGRAM

The Manitoba Hydro Environmental Protection Program (EPP) consists of a framework for implementing, managing, monitoring, and evaluating environmental protection measures in a consistent and responsible manner with regulatory requirements, corporate commitments, best practices, and public expectations. The EPP consists of an implementation framework that outlines how environmental protection is delivered and managed, and Environmental Protection Plans (EnvPPs) that prescribe measures and practices to avoid and minimize adverse environmental effects. EnvPP's are the main implementation tool for achieving effective implementation of mitigation measures and follow-up requirements identified in the environmental assessment.

Following receipt of the required Environmental Act Licence, the required content tentatively identified in the Draft EnvPP will be finalized taking into account supplementary provisions flowing from any conditions attached by the regulatory authorities to approval of the facilities. The final EnvPP will outline specific mitigation measures, including any required monitoring, to be implemented during the construction, operation and maintenance phases of the Project. There are very detailed and focused, Construction, Operation, and Decommissioning Phase

EnvPP's that are developed based on the Final EnvPP for specific phases of the Project. All EnvPP's will generally be implemented to accomplish the following goals:

- to address the terms and conditions outlined in the Environment Act Licence;
- to facilitate the mitigation of environmental effects throughout the life cycle of the Project by providing clear reporting protocols for field construction and operating personnel;
- to incorporate issues and concerns identified during the environmental assessment consultation process;
- summarize environmental sensitivities and mitigation actions;
- to provide specific information on practices to be utilized during the clearing, construction and operation and maintenance phases of the Project; and
- to monitor and, where required, modify clearing, construction and operation and maintenance activities to ensure that work proceeds in accordance with the EnvPPs.

Upon final approval and completion of Project development, follow-up activities are used to verify the accuracy of the environmental assessment of a project or to determine the effectiveness of measures taken to mitigate adverse effects. The main components of environmental protection implementation and follow-up include:

- Inspection – to oversee adherence to and implementation of the terms and conditions of Project approval during Project construction and operation;
- Effects monitoring – to measure the environmental changes that can be attributed to Project construction and/or operation and check the effectiveness of mitigation measures;
- Compliance monitoring – to ensure that applicable regulatory standards and requirements are being met (e.g., for waste discharge and pollutant emissions);
- Management – prepare plans to address important management issues, regulatory requirements and corporate commitments (e.g., access management, emergency response, waste management);
- Environmental auditing – to verify the implementation of terms and conditions, the accuracy of the predictions, the effectiveness of mitigation measures, and the compliance with regulatory requirements and standards; and
- Updating and review – update and finalize the draft EnvPP to include stipulated license terms, conditions and other regulatory requirements, prepare a Construction EnvPP and Operation Phase EnvPPs, and to review and update the EnvPPs to ensure their continued effectiveness.

The EPP is further outlined in Chapter 8.0.

Lake Winnipeg East System Improvement Transmission Project

Project Infrastructure

- Manigotagan Corner Station
- Final Preferred Route (PQ95)
- Alternative Route A
- Alternative Route B
- Alternative Route C

Infrastructure

- Generating Station
- Electrical Station
- 66 kV SubTransmission Line

Landbase

- Community
- Provincial Highway
- Provincial Road
- Local Road
- Town
- Protected Area
- First Nation
- Watercourse
- Waterbody
- Provincial Park
- Wildlife Management Area
- Study Area

Black Island
Hecla/Grindstone Provincial Park
Aghaming
Seymourville
Rice River Road
Hollow Water First Nation
Lake Winnipeg
Wanipigow River
Manigotagan
Observation Point Wildlife Management Area
304
Manigotagan River
Manigotagan River Provincial Park
Duncan Creek
Alternative Route C
Alternative Route B
Sandy River
Black River
Black River First Nation
Alternative Route A
Final Preferred Route
O'Hanly River
Elk Island Provincial Park
504
Victoria Beach
Traverse Bay
59
Sagkeeng First Nation
11
Fort Alexander
Winnipeg River
Bélair
Catfish Creek Wildlife Management Area
Grand Beach Provincial Park
Powerview-Pine Falls
Broadlands Road
St-Georges

INSET B
Scale 1:100,000

Hollow Water First Nation
Wanipigow River
Rice River Road
304
F
Manigotagan Corner Station
E
Manigotagan
Manigotagan River

INSET A
Scale 1:75,000

304
Broadlands Road
Powerview-Pine Falls
E
Pine Falls G.S. & Transmission Station
11

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: December 18, 2012

N

0 6 12 Kilometres
0 4 8 Miles
1:200,000

Manitoba Hydro

Project Study Area

Map 3 - 1

4.0 EXISTING ENVIRONMENT

The following sections are a summary of information provided in the technical reports for each discipline. For more detailed information, refer to these reports.

4.1 PHYSICAL ENVIRONMENT

4.1.1 Climate

Manitoba has a mid-continental climate characterized by four distinct seasons. Generally, winters are long and cold, and summers are short and hot. Historic climate data was collected and analyzed for the LWESI Project Study Area to characterize typical climate conditions that could be expected for the Project.

A summary of the daily data at the Pinawa station is shown in Table 4-1. The average annual precipitation is 586 milliimetres (mm), with most of that (461 mm) falling as rain. There is significant range in temperatures experienced throughout the year, with the highest monthly mean temperature of 19°C occurring in July, and the lowest monthly mean temperature of -18°C occurring in January. Extreme daily minimum and maximum temperatures for the period of record were -48°C in February and 38°C in June for the period from 1969 to 2011.

Climate normals from the Winnipeg Richardson International Airport A (5023222) station were also collected, to compare with the averages calculated for the Pinawa station. The Winnipeg station is further away from the Project Study Area (approximately 100 km away) so would not likely be as representative as the Pinawa station. However, the climate normals are rated A (meeting the highest Environment Canada quality level), so any significant variation between the two stations could be an indicator of problems with the Pinawa data. The Winnipeg normal data are shown in Table 4-2; these data do not indicate any issues with the Pinawa climate data as there were no dramatic or unexpected differences between the two stations.

A wind rose was generated using WRPlotView software (Lakes Environmental 2011) and is shown in Figure 4-1. The wind speed and direction data was derived from the Pinawa (503B1ER) Environment Canada station. The most frequent wind direction was from the south, followed by the south-southeast. There was also a large proportion of wind from the north, north-northwest and northwest. The winds with the highest speeds, greater than 7 metres per second (m/s) (25 kilometres per hour [km/h]), mostly came from the northwest, west-northwest, and north-northwest. The wind directions were generally similar to those indicated in the Winnipeg climate normals.

Table 4-1: Summary of Climate Data from Pinawa (5032162), 1963 – 2011

Parameter	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Average Total Precipitation (mm)	24	17	26	33	65	96	80	73	66	46	29	27	586
Max.Total Precipitation (mm)	71	57	69	92	142	218	162	178	160	122	87	68	822
Min. Total Precipitation (mm)	3	0	3	2	0	24	16	11	2	9	4	9	400
Average Rainfall (mm)	0	2	8	23	63	96	80	73	66	38	8	1	461
Max.Rainfall (mm)	0	0	0	1	0	24	16	11	2	3	0	0	242
Min. Rainfall (mm)	5	23	46	73	142	218	162	178	160	99	76	21	696
Average Snowfall (cm)	23	16	18	10	2	0	0	0	0	8	22	26	125
Max. Snowfall (cm)	70	57	46	65	24	0	0	0	5	37	61	68	203
Min. Snowfall (cm)	3	0	0	0	0	0	0	0	0	0	0	9	58
Average Min. Temperature (°C)	-23	-20	-13	-3	4	10	13	12	7	1	-8	-18	-3
Extreme Min. Temperature (°C)	-44	-48	-41	-29	-14	-4	-1	-2	-7	-16	-35	-40	
Average Max. Temperature	-12	-8	-1	10	17	22	25	24	18	10	-1	-9	8
Extreme Max. Temperature (°C)	10	12	20	33	35	38	37	37	36	29	23	10	
Average Mean Temperature (°C)	-18	-14	-7	4	11	16	19	18	12	5	-4	-14	2

Source: Environment Canada (2012); mm = millimetre; cm = centimetre; °C = degrees Celsius; Min. = minimum, Max. = maximum

Table 4-2: 1971-2000 Climate Normals for Winnipeg Richardson International Airport (5023222)

Parameter	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Average Total Precipitation (mm)	19.7	14.9	21.5	31.9	58.8	89.5	70.6	75.1	52.3	36	25	18.5	513.7
Average Total Rainfall (mm)	0.2	2.5	7.5	21.5	58	89.5	70.6	75.1	51.9	31	6.1	1.6	415.6
Average Total Snowfall (cm)	23.1	14.2	15.8	10.1	0.8	0	0	0	0.4	5	21.4	19.8	110.6
Average Daily Min. Temp.(°C)	-22.8	-18.7	-11	-2.4	4.8	10.7	13.3	11.9	6	-0.3	-9.6	-19.1	-3.1
Extreme Min.(°C)	-42.2	-45	-37.8	-26.3	-11.1	-3.3	1.1	0.6	-7.2	-17.2	-34	-37.8	
Average Daily Max. Temp. (°C)	-12.7	-8.5	-1.1	10.3	19.2	23.3	25.8	25	18.6	10.8	-0.9	-9.7	8.3
Extreme Max. (°C)	7.8	11.7	23.3	34.3	37	37.8	37.8	40.6	38.8	30.5	23.9	11.7	
Daily Average Temp. (°C)	-17.8	-13.6	-6.1	4	12	17	19.5	18.5	12.3	5.3	-5.3	-14.4	2.6
Average Wind Speed (km/h)	17.1	16.7	17.7	18.4	17.9	16.4	14.6	14.9	17.1	18	17.4	17.1	16.9
Most Freq. Wind Direction	S	S	S	S	S	S	S	S	S	S	S	S	S
Max. Hourly Wind Speed (km/h)	70	80	81	80	72	80	89	74	71	77	87	78	
Max. Gust Wind Speed (km/h)	106	129	113	106	109	127	127	122	98	119	124	98	
Direction of Max. Wind Gust	SE	NW	N	N	NW	W	S	NW	NW	W	W	W	NW

Source: Environment Canada (2012); mm = millimetre; cm = centimetre; °C = degrees Celsius; km/h = kilometres per hour; Min. = minimum, Max. = maximum

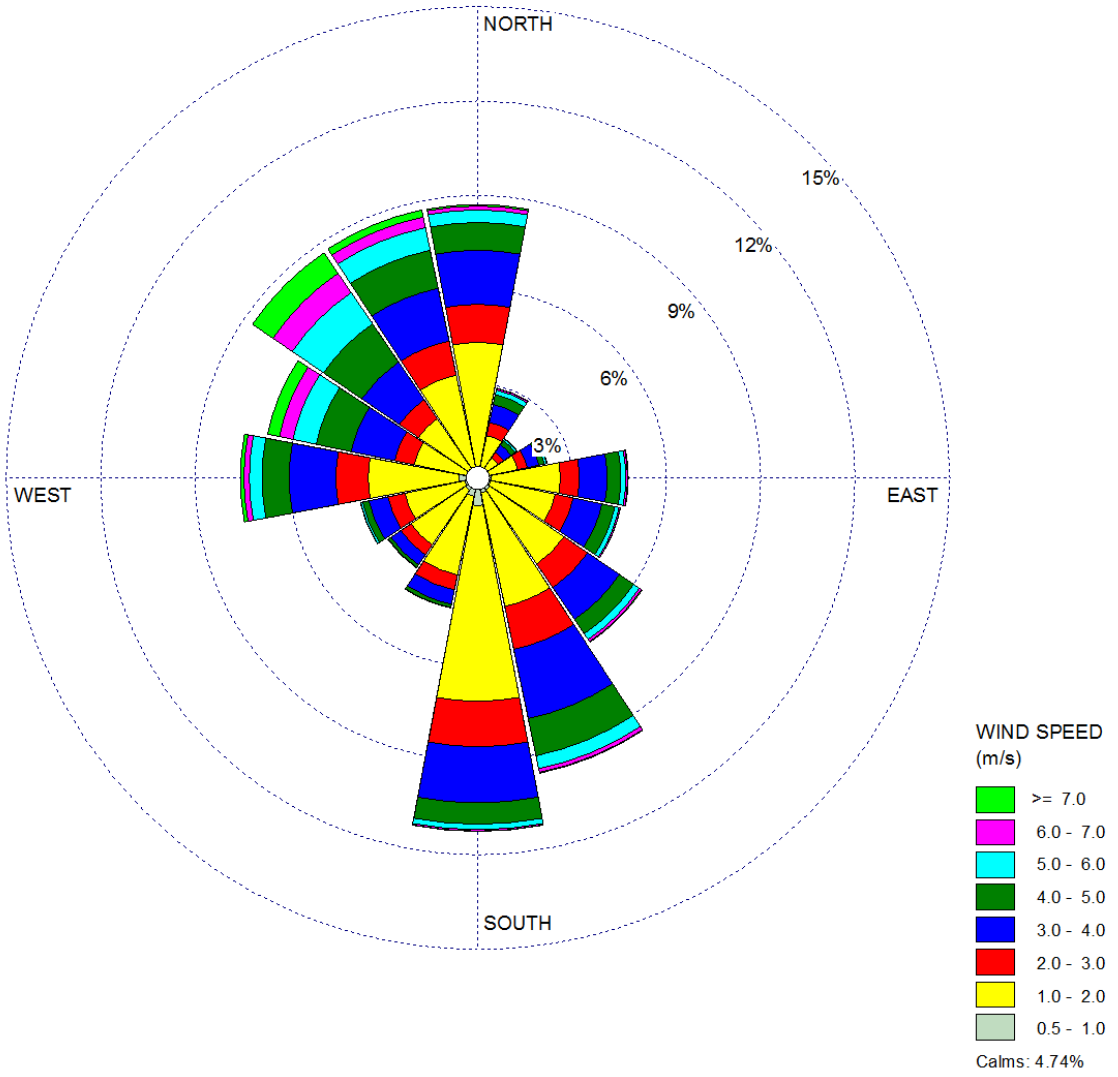


Figure 4-1: Wind Rose Pinawa (503B1ER) from 1988 to 2010

4.1.2 Soils and Surficial Geology

The Pine Falls–Manigotagan 115 kV Line PQ95 will be located in the east margin of the former Glacial Lake Agassiz. The terrain is dominated by vast areas of organic wetlands occupying low-lying areas. These areas are wet, flat and underlain by clays and silts of glaciolacustrine origin. More elevated areas are near shore glaciolacustrine clays, silts and fine sands. These deposits were placed above the underlying Precambrian bedrock and mimic the topography of the underlying bedrock. Localized till deposits occur as outcrops on higher elevations or between the lacustrine deposits and bedrock. Shoreline sands occur along portions of the

southern end of the Project Study Area and south of Manigotagan. A review of well records available for the Project Study Area show overburden ranging from 5 metres (m) to 20 m in total thickness. This represents only those areas investigated but demonstrates that there can be a substantial section of unconsolidated materials on top of the bedrock. Areas of exposed bedrock are limited within the Project Study Area.

4.1.3 Bedrock Geology

The majority of the bedrock beneath the Project Study Area is granodiorite gneiss, metasedimentary gneiss and tonalite gneiss. Most of the bedrock has been subjected to some degree of metamorphism but the rock types are stable and durable from both a landform perspective as well as a foundation unit for hydro towers where the rock is either exposed or within a reasonable distance of ground surface.

4.1.4 Hydrogeology

Groundwater resources are limited in the Project Study Area. The unconsolidated deposits overlying bedrock are typically fine grained and will not produce economical quantities of groundwater. Exceptions include localized areas of sands and gravels where the hydraulic conductivity is higher or areas of finer grained soils that are fractured and connected to a source of recharge water, such as an adjacent river or lake. The bedrock underlying the Project Study Area is predominantly metasedimentary and metavolcanic crystalline gneiss of variable mineralogy but almost universally low in hydraulic conductivity. Secondary structure such as faults and fracture planes represent limited pathways for groundwater flow as long as a hydraulic connection to a source of recharge water exists.

Development in the area is limited so there is minimal information available on hydrogeology. Water well records were obtained from MCWS. Records for 31 wells or test holes were provided within the Project Study Area. Thirteen were noted as dry, 14 were completed in bedrock and three were completed in sands and gravels above bedrock. Many of the logs indicate that the holes were dry upon completion. For test holes completed as wells, no detail was provided on the production capacity of the well or the quality of the groundwater. Therefore, the majority of the groundwater usage in the Project Study Area is from limited aquifers within the bedrock.

It is expected that yields, where groundwater is encountered, will generally be low due to the limited hydraulic conductivity. There are no regional aquifers and because of the limited resources and demand for groundwater, no broad based aquifer studies have been completed in the Project Study Area. Shallow aquifers will typically be of limited areal extent and be bounded hydraulically by adjacent wetlands or water features. Deeper wells, in particular those in bedrock where more productive fractures have been encountered, may be more extensive, with recharge and discharge areas occurring at greater distances. Any deeper regional systems would tend to flow westward with Lake Winnipeg serving as a discharge boundary.

A more complete description of the existing environment with respect to climate, soils and geology is provided in the Climate, Soils, Hydrogeology and Geology Technical Report (Golder 2012a).

4.2 AQUATIC ENVIRONMENT

4.2.1 Surface Hydrology

The Project Study Area contains six main river watersheds. They are, from south to north, the Winnipeg, O'Hanly, Black, Sandy, Manigotagan and Wanipigow Rivers. With the exception of the Wanipigow River, the preferred route would cross all of these, as well as an un-named tributary of Pine Creek (which flows into the Winnipeg River via Pine Creek), Duncan Creek (which flows into the Manigotagan River), three additional creeks, one beaver pond, and nine man-made water features (two former borrow pits/quarries now water-filled and seven highway drainage channels near PR #304). The six main river watersheds range in size from 345 km^2 to over 100,000 km^2 (Table 4-3). While lakes are a common feature in the Project Study Area, few are located in proximity of the preferred route, and none are located west of PR #304.

Table 4-3: Watershed size in the Project Study Area

Watershed	Area (km^2)[1]
Wanipigow River	1,929
Manigotagan River	1,102
Sandy River	346
Black River	740
O'Hanly River	345
Winnipeg River	126,400

1. Watershed area in Manitoba only, except Winnipeg River.

Source: Kotak, unpublished data, North/South Consultants Inc. 2006

The Project Study Area includes ephemeral, intermittent and perennial watercourses. Ephemeral watercourses are those which are dry for periods of the year and which rely wholly on precipitation events or snowmelt for water. Intermittent watercourses may contain water for most or all of the year, but water flow may cease during dry periods. This type of watercourse usually drains low-lying areas such as bogs, fens and marshes. Water flow can also cease due to beaver activity (i.e., damming of the watercourse), which is a common feature in smaller watercourses in the Project Study Area. Perennial watercourses are those which contain water and water flow throughout the year, in most years. Under drought conditions, smaller perennial watercourses (creeks, streams and sections of smaller rivers) may lack water.

Discharge, varies considerably in the watercourses crossed by the preferred route, depending on the size of the watercourse (e.g., river, creek), size of the watershed, weather and climatic

trends, and the ability of the watershed to store water (which is influenced by the proportion and type of wetlands in the watershed). Mean discharge in the summer months in small intermittent creeks crossed by the preferred route ranged from 0.03 cubic metres per second (m^3/s) to 0.15 m^3/sec, from 0.5 to 5.4 m^3/sec in smaller rivers such at the O'Hanly River, up to 13.9 m^3/sec in larger rivers such as the Manigotagan River, and over 1,200 m^3/sec in the largest river in the Project Study Area (i.e., the Winnipeg River) (Kotak et al. 2005; Miette 2008; Environment Canada 2012).

4.2.2 Water Quality

Water quality in the Project Study Area is typical of that in the Canadian shield. Water quality is however, highly variable between the watercourses crossed by the preferred route, and is influenced by watershed features (soil and forest types found in the watershed, peatlands), disturbance history (forest fires, timber harvesting) and beaver activity (in the creeks and smaller streams) (Kotak et al. 2005). Water quality can be described by several parameters, some of which have direct relevance to fish and fish habitat.

The pH of water varies from slightly acidic to slightly basic. The pH of water depends on a number of factors, including the type of soils in the watershed. For example, watercourses which contain extensive peatlands such as bogs in their watersheds, along with their organic soils, have more acidic water. Examples include the O'Hanly River, and smaller watercourses crossed by the preferred route such as the O'Hanly mid tributary and Kapukwaywetewunk Creek. In contrast, water is slightly basic in Sandy River, Duncan Creek, Manigotagan River and Wanipigow River due to a higher proportion of mineral soils (e.g., clay-based soil) and fewer peatlands in their watersheds.

Phosphorus, a key plant nutrient in aquatic ecosystems, ranges from approximately 30 micrograms per litre (µg)/L to >250 µg/L during the summer months in watercourses crossed by the preferred route. The wide range in total phosphorus concentration can be attributed to soil type in the watersheds, as well as the proportion of watershed area disturbed and frequency of disturbance by forest fires and timber harvesting (Kotak et al. 2005). In addition, beaver activity in the smaller watersheds (e.g., Duncan Creek, O'Hanly Mid Tributary, Kapukwaywetewunk Creek) can naturally elevate phosphorus concentrations through back flooding of riparian soils (e.g., floodplain areas) and stagnation of water flow. Phosphorus concentrations in smaller watercourses (e.g., Duncan Creek) can also be much higher (up to 3.5 fold higher) in winter months compared to summer, due to a loss of dissolved oxygen over the winter and a resulting release of phosphorus from the bottom sediments (Kotak et al. 2005).

Water clarity can be described in terms of water colour and turbidity. Dissolved organic carbon (DOC) is a measure of water color, and most water bodies in the Canadian shield have some degree of brown color. Water colour is a result of acidic compounds originating from peatlands (bogs, fens) and the degree of color in water bodies in the Project Study Area is a result of a complex interaction between soil type, disturbance history and beaver activity in the watersheds (Kotak and Selinger 2006). The Manigotagan River has the least amount of colour (approximately 18 milligrams per litre (mg)/L DOC), while water in the O'Hanly Mid Tributary and

Kapukwaywetewunk Creek are stained dark brown (up to 72 mg/L DOC). Turbidity in the watercourses crossed by the preferred route is generally low (less than 10 nephelometric turbidity units [NTU]), although turbidity in O'Hanly River upstream of PR #304 can be much higher (over 40 NTU), due to beaver activity along the predominantly clay-based banks of the river (Kotak and Selinger 2006).

4.2.3 Fish Species

The Project Study Area contains at least 41 species of fish, representing 14 families. However, few systematic fisheries surveys have been conducted in the watercourses in the vicinity of the preferred route. Most fisheries studies have focused on lakes of recreational sport fishing importance in the eastern half of the Project Study Area. Of the studies conducted since the late 1990s (AEC 1999; Kotak 2006), fish communities in the main rivers are diverse, including species important to communities and for recreational sport fishing and many forage species. These include walleye (*Sander vitreus*), sauger (*Sander canadensis*), northern pike (*Esox lucius*), lake whitefish (*Coregonus clupeaformis*), channel catfish (*Ictalurus punctatus*), and several species of bass, suckers, shiners and darters, among others. Lake Sturgeon (*Acipenser fulvescens*) is found in the Winnipeg River, and likely also in the lower reaches of other rivers (Manigotagan, Wanipigow) where they enter Lake Winnipeg. Lake trout (*Salvelinus namaycush*) is only found in Garner Lake, located in the extreme eastern part of the Project Study Area. The O'Hanly Pond, located approximately 5 km south of the O'Hanly River on PR #304, is stocked with rainbow trout (*Oncorhynchus mykiss*).

4.2.3.1 Species of Conservation Concern

There are two fish species that are listed under Schedule 1 of the federal *Species at Risk Act.* They are carmine shiner (*Notropis pertcobromus*) and silver chub (*Macrhybopsis sotreiana*). The carmine shiner is listed as Threatened, and is found in Peterson Creek and the Bird River, in the extreme eastern portion of the Project Study Area. The silver chub, listed as Special Concern, has been observed, rarely, in Lake Winnipeg (Stewart and Wilkinson 2004). The chestnut lamprey (*Ichthyomyzon castaneus*), listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), has been observed, rarely, in the Winnipeg River (EBM 2002). The shortjaw cisco (*Coregonus zenithicus*) is designated as Threatened by COSEWIC, and has been observed in the Winnipeg River (EBM 2002). Lake Sturgeon (*Acipenser fulvescens*) is found in the Winnipeg River, and is listed as Endangered by COSEWIC.

There are no fish species listed under the *Endangered Species Act* (MBESA) in the Project Study Area.

4.2.4 Fish Habitat

Fish habitat has a broad definition under the *Fisheries Act*. Fish habitat can be any place that a fish relies on for food, shelter, reproduction, growth or migration. Fish habitat includes both

physical habitat (e.g., water velocity, water depth, substrate) and the chemical environment (water quality variables such as suspended solids, turbidity and dissolved oxygen).

The degree of permanence of a water body can have a substantial effect on the usefulness of the water body as fish habitat. Ephemeral watercourses generally provide marginal or no fish habitat, as water may not be available during critical life stages. There are several ephemeral water courses in the Project Study Area, including an un-named tributary of Pine Creek. Intermittent water courses may provide marginal habitat on a seasonal basis (e.g., during spawning periods or as nursery habitat) for larger bodied fish species, and may provide longer-term habitat for small bodied fish species. However, water depths may be sufficiently shallow to allow the watercourse to freeze to the bottom in winter. There are several intermittent watercourses in the Project Study Area, including the O'Hanly Mid Tributary and Kapukwaywetewunk Creek. Perennial watercourses such as larger creeks, stream and rivers that. There are more than ten perennial water courses in the Project Study Area, including the O'Hanly, Black, Sandy, Manigotagan and Wanipigow Rivers. In contrast to ephemeral and intermittent watercourses, perennial water courses also tend to provide more complex physical habitat, including riffle/pool/run sequences, a diversity of substrates (clay, sand, cobble, boulders) and cover (e.g., large woody debris, undercut banks).

Spawning areas are of particular importance as fish habitat The ATK workshops provided site-specific spawning locations for some of the watercourses crossed by the preferred route, for a number of fish species. Spawning areas were identified by ATK participants on the O'Hanly, Black, Sandy and Manigotagan rivers.

Fish habitat was chosen as a VEC due to legislative requirements (under the *Fisheries Act*) and potential interaction with the Project.

A more complete description of the existing environment with respect to the aquatic environment is provided in the Aquatic Environment Technical Report (Miette 2012).

4.3 TERRESTRIAL ENVIRONMENT

4.3.1 Vegetation

The Project is located in the boreal forest in Manitoba. Forested areas are dominated by black spruce (*Picea mariana*) with a mix of aspen (*Populus tremuloides*), white birch (*Betula papyifera*) and white spruce (*Picea glauca*) occurring in drier sites, balsam fir as a component in moist sites and bogs and fens supporting black spruce and tamarack (*Larix laricina*) in wetter sites. Wetlands support sparsely treed bogs, willow swamps, fens and sedge meadows. In fens the ground cover is usually low shrubs and sedges. The vegetation understory is a diverse mix of shrubs and herbs under deciduous and mixed forest stands. Bedrock outcrops often support jack pine (*Pinus banksiana*) with low shrubs like blueberries and mosses and lichens. In bogs dominated by black spruce, low ericaceous shrubs and mosses form the understory.

The Project Study Area is largely Crown Land with a history of Aboriginal settlement, hydroelectric development, resource extraction and recreation. A small amount of agricultural land is located near the Winnipeg River. As a result of the construction of PR #304, drainage channels were built at right angles to the road. Logging activity in previous years has resulted in many access trails being constructed. Both these activities have altered the natural landscape by removing tree cover. Forest fires (the latest in 1999) are frequent and result in continual forest regeneration.

4.3.1.1 Species of Conservation Concern

Field investigations documented 11 plant species ranked as species of conservation concern by the MBCDC within the Project Study Area. Three species were ranked as rare (S2): Hooker's orchid (*Platanthera hookeri*), sessile-fruited arrowhead (*Sagittaria rigida*) and running club-moss (*Lycopodium clavatum var. clavatum*). Four uncommon species (S3) were found: moonwort fern (*Botrychium lunaria*, black ash (*Fraxinus nigra*), slender sedge (*Carex gracillima*) and blueberry (*Vaccinium caespitosum*). One plant, swollen sedge (*Carex intumescens*), was ranked as possibly uncommon (S3?). Three plants ranked as uncommon to widespread (S3S4) were found: wild ginger (*Asarum canadense*), sensitive fern (*Onoclea sensibilis*) and wintergreen (*Gaultheria procumbens*).

No species listed in the MBESA have been recorded in the area, and none were documented during field studies.

A more complete description of the existing environment with respect to vegetation is provided in the Vegetation Technical Report (Calyx 2012).

4.3.2 Wildlife and Habitat

Wildlife species are part of an interconnected system where energy and matter are cycled through producers, consumers, and decomposers (Chapin et al. 2011). Up to 370 species of mammals, birds, amphibians, and reptiles could range into the Project Study Area. These include year-round residents, migrants, and occasional visitors. The Project Study Area is in the Lac Seul Upland Ecoregion of the boreal forest. Habitat is dominated by coniferous species, with some mixedwood habitat. Fire has resulted in jack pine communities and to a lesser degree, aspen. Fens, bogs and tamarack communities are scattered, and peatlands are common (Smith et al. 1998). Wildlife species found in the Project Study Area and a brief description of their role in ecosystem function are summarized below.

4.3.2.1 Mammals

Mammals play an important role in the biophysical and socio-economic environments. They are components of ecological cycles and provide food for people. Up to 53 mammal species could range into the Project Study Area. Mammal groups include small mammals, aquatic and terrestrial furbearers, large carnivores, and ungulates.

Small mammals include mice, voles, shrews, bats, squirrels, and chipmunks, and are the foundation of the carnivore and omnivore food webs. They are generally short-lived and are prolific breeders; most have more than one litter a year (Banfield 1987). Twenty-five species could occur in the Project Study Area. Most of the small mammal species in the Project Study Area are year-round residents. Eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), northern myotis (*Myotis septentrionalis*), and silver-haired bat (*Lasionycteris noctivagans*) are migratory. All of the small mammal species breed in the region, with the possible exception of woodland jumping mouse (*Napaeozapus insignis*), whose presence is uncertain.

Aquatic furbearers are medium-sized mammals that rely on water for a large portion of their food or habitat. Muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), mink (*Mustela vison*), and river otter (*Lontra candensis*) can be found in the Project Study Area. All are year-round residents and breed in the region.

Terrestrial furbearers spend the majority of their time and derive most or all of their food from upland (terrestrial) habitats. They are medium-sized mammals and include species such as American marten (*Martes americana*), coyote (*Canis latrans*), and lynx (*Lynx canadensis*). Up to 18 species could occur in the Project Study Area. Most terrestrial furbearer species are year-round residents and breed in the region. The status of American badger (*Taxidea taxus*), bobcat (*Lynx rufus*), long-tailed weasel (*Mustela frenata*), and white-tailed jackrabbit (*Lepus townsendii*) is uncertain. Of the four species, only bobcat is thought to breed in the area, but all could be residents of the region.

Large carnivores are larger-sized mammals that prey on other animals. Large carnivores that could be found in the Project Study Area are black bear (*Ursus americana*), gray wolf (*Canis lupus*), and cougar (*Puma concolor*). All are residents, and black bear and gray wolf breed in the region. Cougars are sparse in eastern Manitoba, and the Project Study Area is unlikely to have a breeding population. Game Hunting Area (GHA) 26, in which the Project Study Area occurs, can likely support approximately 1,200 black bears, but the black bear population is unknown (Manitoba Model Forest 2011). There are an estimated 25 packs of gray wolves in GHA 26 (Manitoba Model Forest 2012).

Ungulates are hoofed mammals that contribute to ecosystem function by consuming plants and as prey for large carnivores. Ungulates that could occur in the Project Study Area include boreal woodland caribou (*Rangifer tarandus caribou*), white-tailed deer (*Odocoileus virginianus*), and moose (*Alces alces*). All are residents of the region and breed there. The range of the boreal woodland caribou overlaps only a very small portion of the Project Study Area, and core range is not present (Schindler 2005) (Map 4-1). The moose population in GHA 26 was estimated at 823 animals in 2009/10 (MCWS unpublished data).

Moose and American marten were selected as VECs. A more complete description of the existing environment with respect to mammals is provided in the Wildlife Technical Report (WRCS 2012).

4.3.2.2 Birds

Of the approximately 400 species of birds found in Manitoba, 306 could be found in the Project Study Area, although some are occasional or rare migrants. Of these, 66 were found during field surveys and 96 have been observed in the region during independent breeding bird surveys (Manitoba Bird Atlas 2012).

Bird groups include waterfowl and other waterbirds, colonial waterbirds, birds of prey, upland game birds, woodpeckers, and songbirds and other birds.

Waterfowl and other waterbirds are primarily migratory, nesting in Manitoba in spring and wintering in the southern United States and Central and South America. For the purpose of analysis, waterfowl and other waterbirds are ducks, geese, swans, loons, coots, rails, and cranes. Up to 39 species can be found in the Project Study Area. These birds are associated with temporary and permanent waterbodies, and occasionally can be found along rivers and creeks located in the Project Study Area. Beaver floods provide suitable habitat.

Birds that form groups to breed and nest are termed colonial waterbirds (Parnell et al. 1988). These birds are generally migratory. For this study, colonial waterbirds are gulls, terns, grebes, pelicans, cormorants, herons, bitterns, and shorebirds. Turkey vultures (*Cathartes aura*), whose taxonomy is uncertain but are thought to be related to storks (Koonz and Taylor 2003a) are included in this group. It is estimated that 67 species could be found in the Project Study Area. Habitat such as large lakes is limiting to species occurrences in the Project Study Area.

Up to 29 species of birds of prey can be found in the Project Study Area including falcons, hawks, owls, and osprey. They occupy a variety of habitats and can be migratory or year-round residents. Rivers, wetlands and forest are important habitat for these species.

Upland game birds can be found in forested and non-forested habitats and mainly include grouse and partridge. Seven species could be found in the Project Study Area, although ruffed grouse (*Falcipennis Canadensis*), spruce grouse (*Bonasa umbellus*) and sharp-tailed grouse (*Tympanuchus phasianellus*) are the most likely residents. Forested habitat and openings found in the Project Study Area are important for these species.

Of the ten woodpecker species that occur in Manitoba, five are permanent residents, three are summer visitors, and two are infrequent visitors (Taylor 2003). Nine species could occur in the Project Study Area, four of which were observed during field studies. Forested habitat is important for most of these species.

Songbirds and other birds, including passerines, are the most abundant of all bird groups in Manitoba. Some of the bird families in this group such as chickadees, nuthatches, and some finches and jays are year-round residents, while other groups including flycatchers, swallows, thrushes, kinglets, pipits, vireos, tanagers, blackbirds, sparrows, and warblers are mainly short-distance or long-distance migrants.

Many of the bird species in the boreal forest can be found in a range of habitats, often with a preference for particular types. Species diversity in the Project Study Area was similar to that documented in similar forest types in the Manitoba Model Forest, which overlaps with the

Project Study Area (Wildlife Resource Consulting Services and Silvitech Consulting 1997). Some differences in species diversity were apparent when the age and composition of the forest were considered. Bird communities were similar in habitat disturbed by fire or timber harvest, and communities of the most common birds were similar in riparian and non-riparian forest types.

Bald eagle (*Haliaeetus leucocephalus*), spruce grouse (*Dendragapus canadensis*), olive-sided flycatcher (*Contopus borealis*), and Canada warbler (*Wilsonia canadensis*) were selected as VECs.

A more complete description of the existing environment with respect to birds is provided in the Wildlife Technical Report (WRCS 2012).

4.3.2.3 Amphibians and Reptiles

Up to 11 species of amphibians and reptiles can be found in the Project Study Area. These species are preyed upon by birds and mammals. Amphibians generally live and breed in or near water. This group includes salamanders, frogs, and toads. Eight species could occur in the Project Study Area. Wood frog (*Rana sylvatica*), gray tree frog (*Hyla versicolor*), boreal chorus frog (*Pseudacris triseriata*) and spring peeper (*Hyla crucifer*) are common species. Reptiles, which occur in aquatic and terrestrial habitats, include turtles and snakes. The western painted turtle (*Chrysemys picta*) and red-sided garter snake (*Thamnophis sirtalis*) are most likely found in the Project Study Area.

A more complete description of the existing environment with respect to amphibians and reptiles is provided in the Wildlife Technical Report (WRCS 2012).

4.3.2.4 Species of Conservation Concern

Several wildlife species that could occur in the Project Study Area have been federally or provincially listed as species at risk. Of the mammal species that could be found in the Project Study Area, only the boreal woodland caribou is currently listed. It has been designated threatened by the federal *Species at Risk Act* (SARA) and the MBESA. The Owl-Flintstone boreal woodland caribou herd's range is partially contained in the Project Study Area. A recovery strategy (Manitoba Conservation 2005) and a draft action plan for high risk ranges including Owl-Flintstone and Atikaki-Berens contain plans for implementing recommended recovery actions to help guide recovery efforts (Manitoba Conservation 2011).

An emergency assessment by COSEWIC concluded that the little brown myotis, which has been documented in the Project Study Area, and the northern myotis are endangered and recommended that they be placed on Schedule 1 of SARA (COSEWIC 2012). The wolverine (*Gulo gulo*) has been designated a species of special concern by COSEWIC, but is not listed by SARA or MBESA.

Of the 306 bird species that could be found in the Project Study Area, 23 are listed by SARA, MBESA, or both (Table 4-4). Of these, yellow rail (*Coturnicops noveboracensis*), least bittern (*Ixobrychus exilis*), short-eared owl (*Asio flammeus*), common nighthawk (*Chordeiles minor*),

whip-poor-will (*Caprimulgus vociferus*), olive-sided flycatcher (*Contopus borealis*), Canada warbler (*Wilsonia canadensis*), and rusty blackbird (*Euphagus carolinus*) are the most likely to be found in the Project Study Area, and were the focus of the assessment for listed bird species. Horned grebe (*Podiceps auritus*) is not listed by SARA or MBESA, but is listed as special concern by COSEWIC. While the ranges of the other listed bird species may overlap the Project Study Area, there is generally little to no breeding habitat available and they are not likely to occur in the area; however these species may migrate through the area. Canada warbler and olive-sided flycatcher are VECs and are discussed in Section 4.3.2.5.

Two of the species of amphibians and reptiles that could be found in the Project Study Area are listed by SARA. The northern leopard frog (*Rana pipiens*) and common snapping turtle (*Chelydra serpentine*) are species of special concern.

Table 4-4: Listed Bird Species That Could Occur in the Project Study Area

Group	Species	*Species at Risk Act*	*Endangered Species Act*
Waterfowl and other waterbirds	Trumpeter swan	Not listed	Endangered
	Yellow rail	Special concern	Not listed
	Whooping crane	Endangered	Endangered
Colonial waterbirds	Least bittern	Threatened	Endangered
	Piping plover	Endangered	Endangered
	Red knot	Endangered	Endangered
Birds of prey	Peregrine falcon	Threatened	Endangered
	Ferruginous hawk	Not listed	Endangered
	Burrowing owl	Endangered	Endangered
	Short-eared owl	Special concern	Threatened
Woodpeckers	Red-headed woodpecker	Threatened	Threatened
Songbirds and other birds	Common nighthawk	Threatened	Threatened
	Whip-poor-will	Threatened	Threatened
	Chimney swift	Threatened	Threatened
	Olive-sided flycatcher	Threatened	Not listed
	Loggerhead shrike	Endangered	Endangered
	Sprague's pipit	Threatened	Threatened
Songbirds and other birds	Golden-winged warbler	Threatened	Threatened
	Canada warbler	Threatened	Endangered
	Baird's sparrow	Not listed	Threatened
	Chestnut-collared longspur	Threatened	Endangered
	Rusty blackbird	Special concern	Not listed

4.3.2.5 Valued Environmental Components

Moose

Moose range is extensive in Manitoba (Banfield 1987). In the south, they occupy areas east of Lake Winnipeg to the Ontario border and south of the Winnipeg River (Pattie and Hoffmann 1990). Moose are associated with riparian habitat, especially areas featuring willow, a key forage species. Winter habitat is a critical component of moose range. Cover is beneficial because it helps reduce snow depths and provides relief from thermal stress associated with open areas (Bangs et al. 1985). Preferred calving habitat is on islands and peninsulas, likely for predator avoidance (KBM Forestry Consultants Inc. 2006).

The moose population in GHA 26 increased from the mid-1980s to the early 2000s, then declined from 2005 to 2010 (MCWS unpublished data). GHA 26, in which the Project Study Area is located, is closed to licensed hunters to allow for moose populations to recover (MCWS 2012a). Parts of GHA 26 were also closed to treaty and Aboriginal rights-based hunters in January 2012 (Government of Manitoba 2012) in "moose protection zones." Harvest and predation are the main causes of moose mortality in GHA 26; from 2006 to 2010 gray wolves killed approximately 400 moose per year, and hunters took approximately 275 moose per year (Manitoba Model Forest 2011). Only a small fraction of GHA 17A is located in the Project Study Area north of PR #304.

Moose are prey for gray wolves, but wolf predation alone does not limit moose populations (Palidwor et al. 1995). Moose populations are susceptible to infection by the parasite *Parelaphostrongylus tenuis*, which causes brainworm, a disabling neurological disease that can result in death (Palidwor et al. 1995). The natural host for the disease is white-tailed deer and moose become susceptible when the habitats of the two species overlap such as in the Project Study Area.

American Marten

American martens are predators whose diet varies seasonally (Takats et al. 1999). While voles are the preferred prey (Strickland et al. 1998; Banfield 1987), the American marten diet extends to berries, mice, shrews, snowshoe hare, squirrels, birds, amphibians, insects, and fish, when available (Banfield 1987; Ben-David et al. 1997; Takats et al. 1999).

While American martens spend much of their time in trees, they also move and hunt on the ground (Banfield 1987). Contiguous, mature, or old forest is preferred by this species (Chapin et al. 1998) and optimum habitat includes old growth spruce/fir with a minimum of 30 percent (%) canopy cover (Clark et al. 1987). A well-established understory of fallen logs and stumps is important for denning and dense shrub and **forb** vegetation supports small mammal prey populations (Clark et al. 1987).

American martens are widespread, abundant, and secure throughout their range in Manitoba (NatureServe 2012). Due to their lack of adaptation to extremely cold weather, they require den sites throughout their home ranges. In winter, denning usually occurs in squirrel middens, rock

piles, hollow logs, and stumps (Buskirk 1984), with a preference for subnivean dens (Wilbert et al. 2000). In warmer weather, American martens may rest in the tree canopy (Buskirk 1984), or select dens in hollow trees (Strickland et al. 1998). While there is a tendency to think of American martens as **arboreal**, they spend much of their time on the ground (Francis and Stephenson 1972; Buskirk and Ruggiero 1994).

A total of 4,758 American martens were trapped on traplines 16, 26, 27, and 28 from 1996 to 2011 (WRCS 2012). The American marten harvest was lowest in 1996/1997, and peaked in 2000/2001 (Figure 4-2) when 1,502 were trapped. These records do not give a comprehensive measure of species abundance. Factors such as demand, market prices, and trapper effort can affect the data. Instead, trapping data provide presence/absence information for the region.

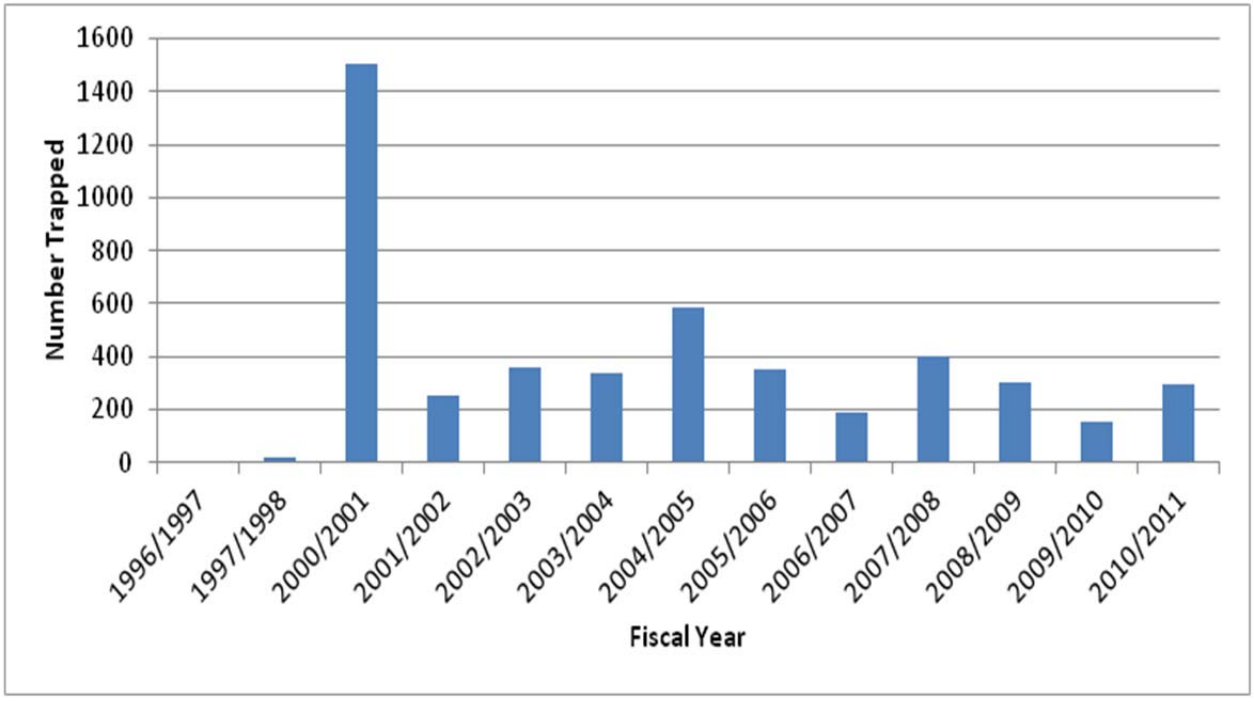


Figure 4-2: American Marten Harvest on Four Registered Traplines Overlapping the Project Study Area, 1996 to 2011

Bald Eagle

Bald eagles are common in Manitoba and nest in all forested areas of the province, with some reports of pairs nesting in agricultural areas (Koonz 2003). There are an estimated 300,000 bald eagles in North America (Rocky Mountain Bird Observatory 2007). Bald eagle nests are commonly found in mature forests, usually within 2 km of a waterbody, likely associated with prey availability in the area (Buehler 2000). When nesting in the vicinity of human activity bald eagles select nest sites at a distance from the disturbance, often including a visual buffer in the form of existing tree stands (Andrew and Mosher 1982). Nests are usually constructed in large

trees that are capable of supporting stick nests and that provide the pair with a view of the surrounding area (Buehler 2000).

Bald eagle roosting is similar to nesting in that individuals perch in trees close to waterbodies suitable for foraging; however, these roosts are generally located much further from waterbodies than nests (Buehler 2000). Migration patterns are complex and associated with the age of the individual; immature eagles are generally nomadic because they have not established a nesting territory, while adult birds will migrate seasonally, usually due to food shortages as a result of seasonal weather changes (Buehler 2000). Although no bald eagles were observed during field studies, records for the Project Study Area include observations from the Manitoba Breeding Bird Atlas.

Spruce Grouse

Spruce grouse distribution generally follows that of the boreal forest (Ross 2007). They can be found throughout Manitoba, with the exception of the southwestern corner of the province, and are year-round residents. Spruce grouse inhabit mature mixedwood forests dominated by conifers and spruce bogs (Holland and Taylor 2003) and tend to be found in upland areas (Johnsgard 2008).

The spruce grouse diet comprises insects, berries, and fungi in summer and conifer needles in winter (Ross 2007). Jack pine and tamarack needles are most frequently consumed, even when black spruce is widely available (Johnsgard 2008). Adult males are generally territorial and relatively sedentary (Johnsgard 2008). Home ranges can be 1.9 to 3.6 hectares (ha), and average 2.8 ha (Johnsgard 2008). Females nest on the ground in concealed locations such as under branches or in brush (Johnsgard 2008).

Spruce grouse are widespread and secure throughout their range (NatureServe 2012) and are hunted in Manitoba (MCWS 2012b). Although no spruce grouse were observed during field studies, records for the Project Study Area include observations from the Manitoba Breeding Bird Atlas. Spruce grouse are expected to be common and widespread in the Project Study Area.

Olive-sided Flycatcher

Olive-sided flycatchers are listed as threatened by SARA and are not listed by MBESA. The estimated population in North America is 1.2 million (Rocky Mountain Bird Observatory 2007). Threats include habitat loss and alteration, particularly due to forest harvest practices, and a general decline in insect prey (COSEWIC 2007).

Olive-sided flycatchers are sparsely distributed south of the boreal forest tree line in Manitoba and are usually found nesting and foraging near boreal forest bogs, wet areas, or recently burned stands (Altman and Sallabanks 2000; Koonz and Taylor 2003b). In northern conifer forests they are most commonly found in edge habitats such as meadows, bogs, and clear-cuts, which appears to correspond to the availability of standing dead trees and remnant live trees that are important for singing and foraging perches (Altman and Sallabanks 2000). This species

can be found in semi-open forest and natural edge adjacent to wetlands. As such, it was selected as the VEC associated with this habitat type.

The attraction to human-caused edge habitats, such as commercial logging, for nesting and foraging is a significant factor in the nesting success of olive-sided flycatchers (Robertson and Hutto 2007). Individuals nesting in recently logged forests have lower rates of nest success when compared to those nesting in naturally burned stands (Robertson and Hutto 2007). Nesting pairs of olive-sided flycatchers have relatively large territories stretching to approximately 1.6 km per pair (Bent 1942). In habitat with dense visual buffers, pairs were found nesting approximately 200 m apart (Altman 1998).

Olive-sided flycatchers migrate to Central America and northern South America in the fall, where they favour wintering habitat similar to their breeding habitat in North America (Altman and Sallabanks 2000). Their dependence on flying insects for foraging results in a late spring arrival and early fall departure (Altman and Sallabanks 2000). A single olive-sided flycatcher was recorded in the Project Study Area during breeding bird surveys (Map 4-2). Olive-sided flycatcher records include observations from the Manitoba Breeding Bird Atlas.

Canada Warbler

Canada warblers are listed as threatened by SARA and endangered by MBESA. They are found in the southern half of the boreal forest in Manitoba, and more commonly in west central Manitoba (Holland et al. 2003c). They inhabit moist mixedwood forests with dense and diverse understory growth, often near open water such as lakes or rivers (Conway 1999). The species was selected as a VEC for this habitat type. Nesting habitat is usually associated with wet, mossy, forested areas; the nest itself is located in tree stumps, fallen logs, and dense ferns (Conway 1999). Nests are very well hidden and are usually inferred from adult behaviour such as territorial singing, alarm calls, and carrying food (Holland et al. 2003). Territory sizes of Canada warblers vary according to regional habitat conditions (Conway 1999); Martin (1960) observed territories of Canada warblers in black spruce-dominated stands averaging 0.2 ha.

There are an estimated 1.4 million Canada warblers in North America (Rocky Mountain Bird Observatory 2007). Factors limiting Canada warbler populations include habitat loss and degradation in wintering and breeding ranges, paved road development, habitat fragmentation, and decline in insect outbreak cycles (COSEWIC 2008). There has been some indication that Canada warbler populations respond positively to spruce budworm outbreaks then experience population declines in following years (Sleep et al. 2009).

Canada warblers are **Neotropical migrants**, traveling from their breeding range in the boreal regions of North America to wintering ranges in northern South America (Conway 1999). Fall migration is in August and September (Holland et al. 2003). In spring, migrants arrive from mid-May to early June (Holland et al. 2003). Canada warblers were recorded at 13 sites in the Project Study Area during breeding bird surveys and are likely widespread wherever suitable habitat may occur (Map 4-3). Records include observations from the Manitoba Breeding Bird Atlas.

A more complete description of the existing environment with respect to wildlife is provided in Wildlife Resource Consulting (2012).

4.3.3 Forestry

The proposed Project is contained within the Boreal Shield Ecozone. The extreme southern portion of the Project Study Area is contained in the Stead (375) Ecodistrict of the Lake of the Woods (91) Ecoregion; however, the majority of the Project occurs in and is characterized by the Wrong Lake (371) Ecodistrict contained within the Lac Seul Upland (90) Ecoregion (Map 4-4). Jack pine and, to a lesser extent, trembling aspen are common on upland sites, due to extensive, repeated fires; however, black spruce is the dominant tree species and is especially widespread on imperfectly drained uplands and bog peat lands. In river valleys, around lakes and on south facing slopes, where drainage is good, white spruce, balsam fir (*Abies balsamea*), trembling aspen and balsam poplar (*Populus balsamifera*) form mixed stands. Deciduous and mixed stands have diverse understoreys of shrubs and herbs, while coniferous stands tend to have feather moss ground cover. Bedrock outcroppings have patchy tree growth, dominated by jack pine, with an understory of low shrubs and groundcover of low ericaceous shrubs, mosses and lichens (Smith et al. 1998).

For forest administrative purposes, MCWS, Forestry Branch has divided the Province into administrative units of Forest Sections and Forest Management Units. The Project is wholly contained within Forest Management Unit 31 of the Pineland Forest Section. MCWS establishes Forest Management Licences to provide a continuous timber supply to wood using industries. The Project Study Area is wholly contained within Forest Management Licence 01, which is allocated to Tembec Industries Inc. The Tembec newsprint mill closed in 2009 and MCWS is in negotiations with Tembec to return Forest Management Licence 01 to the Province. Once Forest Management Licence 01 is returned to the crown, MCWS is proposing to issue a Request for Proposals for the commercial utilization of the timber resources in the Project area (Dojack pers. comm. 2012).

A more complete description of the existing environment with respect to forestry is provided in the Forestry Technical Report (Maskwa 2012a).

4.4 SOCIO-ECONOMIC ENVIRONMENT

4.4.1 Population, Infrastructure, and Services

This section provides an overview of the population, infrastructure, and services in the Project Study Area. The socio-economic Project Study Area is located on the east side of Lake Winnipeg in a forested landscape. Infrastructure and services are concentrated in the small, scattered communities of the Project Study Area. Only one incorporated municipality is included in the Project Study Area, the Town of Powerview-Pine Falls. There are four Northern Affairs Communities (Manigotagan, Seymourville, Aghaming, and Bissett) and three First Nations (Sagkeeng, Black River, and Hollow Water) in or near the Project Study Area. The Northern

Affairs Community of Bissett is included, despite being outside the Project Study Area boundary, because of the importance of resource use surrounding Bissett to the Project Study Area economy.

A summary of the population characteristics of the various communities in the Project Study Area is provided in Table 4-5. The population characteristics of the First Nation Communities is provided in Table 4-6.

Table 4-5: 2011 Population Characteristics of Communities in the Project Study Area

Community included in the Project Study Area*	2011 Population	2006 Population	2006 to 2011 Population Change (%)**	2006 Métis Identity Population***	2011 Median Age of Population
Towns, Villages, and Cities					
Town of Powerview-Pine Falls	1,314	1,294	1.5	350	41.3
Subtotal	*1,314*	*1,294*	*1.5*	*350*	*n/a*
Northern Affairs Communities					
Manigotagan	213	191	11.5	40	43.1
Seymourville	118	132	-10.6	10	19.3
Aghaming	15	15	0.0	-	-
Bissett	130	120	8.3	0	40.5
Subtotal	*476*	*458*	*3.9*	*50*	*n/a*
First Nation Communities					
Sagkeeng (Fort Alexander) First Nation	2,099	2,121	-1.0	30	21.7
Black River (Little Black River) First Nation	521	460	13.3	0	17.3
Hollow Water (Hole Water) First Nation	627	619	1.3	10	19.2
Subtotal	*3,247*	*3,200*	*1.5*	*40*	*n/a*
TOTAL	**5,037**	**4,952**	**1.7**	**440**	**n/a**
Manitoba	1,208,268	1,148,401	5.2	-	38.4

Source: Statistics Canada 2012; Statistics Canada 2006

RM = rural municipality;% = percent; - = not available'; n/a = not applicable.

Note: Subtotals were calculated separately based on the original data, and therefore may not add to match the numbers in the column above.

*St. Georges and Silver Falls are not included in the above table because no precise 2006 and 2011 data is available. They are discussed qualitatively in the socioeconomic technical report (Golder 2012b)

** Percent change in population is calculated by taking the difference between the 2006 and 2011 populations, dividing it by the 2006 population, and multiplying by 100 to get a percentage.

*** Northern Affairs community data from a 20% sample (Statistics Canada 2006).

Table 4-6: 2006 Alternate Population Characteristics of First Nation Communities in the Project Study Area

First Nation	2006 Total	2006 Total Registered Indian
Sagkeeng (Fort Alexander)	2,120	2,065
Black River (Little Black River)	460	455
Hollow Water (Hole Water)	620	595
TOTAL	**3,200**	**3,115**

Source: Aboriginal Affairs and Northern Development Canada 2012.

Transportation in the Project Study Area relies heavily on PR #304, which provides all-season access to all the communities. There are a few other roads in the Project Study Area, primarily roads leading to the individual communities or forestry access roads. Traffic has decreased in the Project Study Area in recent years. There is no railway in the Project Study Area, but there is an airfield in Silver Falls, southeast of Powerview-Pine Falls, and a water aerodrome in Bissett.

Temporary housing in the Project Study Area is limited to Powerview-Pine Falls, Manigotagan, and Bissett. Powerview-Pine Falls has a motor inn, a lodge, and a Recreational Vehicle (RV) park and campground, while Manigotagan has two motels and two campgrounds and Bissett has a hotel, a bed and breakfast, and a campground (Powerview-Pine Falls 2011; Government of Manitoba 2011c; RV Review 2011; Government of Manitoba 2011b)

Communities in the Project Study Area rely on Powerview-Pine Falls for most health and emergency services. Ambulance services are provided to the communities in the Project Study Area out of Pine Falls and Bissett (NEHA 2012; Government of Manitoba 2011a,b,c,d). Powerview-Pine Falls has a hospital and health centre, as well as a fire department and RCMP detachment. Outside Powerview-Pine Falls, several communities have health offices or centres with one to several temporary or permanent staff, volunteer fire departments, and the First Nation communities have First Nations constables.

Other services in the Project Study Area include water and waste water, education, recreation, and utilities. Water and sewer services vary by community, but generally water is piped from a local source to dwellings, and waste water is managed with a lagoon system and piped collection (North Eastman 2012a,b,c,d,e; Government of Manitoba 2011 a,b,c,d). Education facilities are available in most communities, although Manigotagan, Seymourville, and Aghaming students attend the Wanipigow School in Hollow Water First Nation (Powerview-Pine Falls 2011; North Eastman 2012d; Sagkeeng First Nation 2010; North Eastman 2012a). Other utilities in the Project Study Area include hydroelectricity and cell coverage, cable, satellite, and internet in some communities (Government of Manitoba 2011a-d).

4.4.2 Employment and Economy

Employment in the Project Study Area is largely dependent on natural resources and resource-based industries. Until 2010, Tembec industries was a major employer in the Project Study Area, particularly in Powerview-Pine Falls. The closure of the Tembec mill on September 2, 2010 reduced employment options in the Project Study Area. In Powerview-Pine Falls, other employers include the hospital, government district offices, Manitoba Telecom Services, and small businesses. Livelihoods relating to tourism and recreation activities (e.g., boating, sailing, swimming, hunting, fishing, snowmobiling, cross country skiing, and hiking) are also found in Powerview-Pine Falls due to the high influx of tourists and summer residents in the area.

In the Northern Communities, including the Northern Affairs Communities and First Nations, livelihoods are commonly related to fishing, hunting, and trapping (Government of Manitoba 2011a,b,c,d; KPIs). Construction of a road along the east side of Lake Winnipeg by the East Side Construction Authority is also providing employment and livelihoods in the Project Study Area. In Manigotagan, there is also wild rice harvesting, as well as some tourism related activities. Commercial fishing is a major livelihood in the three First Nation communities. Commercial fishers in the area deliver catches to the Wanipigow Fish Station on Hollow Water First Nation. In addition, all three First Nations are involved in trapping and hunting. The economy in Sagkeeng First Nation is also driven by government services and commercial businesses. There is wild rice harvesting by Black River and Hollow Water First Nations. Black River First Nation is also involved in agricultural development.

Level of education varies across the Project Study Area. In the Northern Affairs and First Nations communities, the majority of the population has no degree, diploma, or certificate (Table 4-7). In contrast, in Powerview-Pine Falls, the majority of the population has a high school certificate or equivalent, or some form of post-secondary education.

The labour force participation rate is higher in Powerview-Pine Falls than in other Project Study Area communities (Table 4-7). Similarly, the unemployment rate is lower in Powerview-Pine Falls than in other Project Study Area communities. Income in Powerview-Pine Falls is almost double that in other Project Study Area communities. The labour force in the Project Study Area is dominated by sales and service jobs, and trades, transport, equipment operator, and related occupations. The Town of Powerview-Pine Falls has more occupations in processing, manufacturing, and utilities, and in business, finance, and administration than other communities in the Project Study Area. Conversely, the Northern Affairs Communities and First Nations have more occupations in primary industry, and in social science, education, government service, and religion.

Businesses in the Project Study Area are mostly concentrated in Powerview-Pine Falls, although most of the other communities have a few local businesses. Seymourville and Aghaming are small communities and rely on Manigotagan and Hollow Water First Nation for local business services.

Table 4-7: 2006 Education and Employment Indicators in Communities in the Project Study Area

Community included in the Project Study Area	2006 Population	2006 Population with No Certificate, Diploma, or Degree (%)*	2006 Population with High School Certificate or Equivalent (%)*	2006 Population with Post-secondary Education Diploma or Certificate (%)*	2006 Labour Force Participation Rate (%)*	2006 Unemployment Rate (%)*	2005 Median Pre-tax Income of Private Households ($)	2005 Median After-tax Income of Private Households ($)
RM of Alexander Communities								
Town of Powerview-Pine Falls	1,294	26.1	33.0	40.4	69.5	5.0	59,874	50,663
Subtotal	*1,294*	*26.1*	*33.0*	*40.4*	*69.5*	*5.0*	*n/a*	*n/a*
Northern Affairs Communities								
Manigotagan	191	-76.9	7.7	26.9	37.0	30.0	-	---
Seymourville	132	-63.0	-29.6	-7.4	-46.4	0.0	-	-
Aghaming	-	-	-	-	-	-	-	-
Bissett	120	26.1	21.7	21.7	75.0	0.0	-	-
Subtotal	*370*	*58.1-*	*20.3-*	*18.9*	*50.7-*	*7.9-*	*n/a*	*n/a*
First Nation Communities								
Sagkeeng First Nation (Fort Alexander)	2,121	57.1	13.9	28.6	50.9	22.2	27,136	26,837
Black River First Nation	460	64.8	9.3	22.2	47.2	24.0	20,416	20,416
Hollow Water First Nation	619	65.3	12.0	22.7	53.3	25.0	29,056	29,056
Subtotal	*3,200*	*59.7*	*12.9*	*26.6*	*50.6*	*23.0*	*n/a*	*n/a*
TOTAL	**4,952**	**49.4**	**19.8**	**29.9**	**50.9**	**14.8**	**n/a**	**n/a**
Manitoba	**1,148,401**	**29.5**	**26.7**	**43.9**	**67.3**	**5.5**	47,875	41,844

Sources: Statistics Canada 2007 Statistics Canada 2006..
RM = Rural Municipality;% = percent; - = not available.
Note: Subtotals were calculated separately based on the original data, and therefore may not add to match the numbers in the column above. Also, Statistics Canada uses a random rounding process that rounds numbers to an interval of 5, which can affect population totals and unemployment rates. (e.g., four unemployed individuals in a community would either be rounded down to 0 or up to 5).
* Highest level of education attained – Northern Affairs community data is from a 20% Sample

4.4.3 Personal Well Being

Overall human health in the Project Study Area is similar to other areas of Manitoba. Premature mortality rates are slightly higher in the Project Study Area, suggesting that the Project Study Area population may be experiencing slightly more health problems than the larger provincial population.

Currently, visual aesthetics, electromagnetic fields, and noise in the Project Study Area are mostly influenced by local communities and developments along PR #304. An existing 66 kV transmission line travels through the Project Study Area along PR #304. There are a variety of access roads for forestry, as well as a few highways or provincial roads branching off PR #304 and leading out of the Project Study Area. Besides the communities, road infrastructure, and the transmission line, the majority of the Project Study Area is relatively undisturbed woodland. Electro-magnetic fields in the Project Study Area are generated by the existing 66 kV transmission line as well as local sources in each community (e.g., power sockets, x-ray machines, radio stations, and cell phone base stations). Currently, noise in the Project Study Area consists primarily of typical community noise, such as traffic, and small-scale construction.

Community organization in the Project Study Area includes incorporated municipalities, Northern Affairs Communities, and First Nations. Incorporated municipalities, which in the Project Study Area are limited to the Town of Powerview-Pine Falls, have elected mayors and councils. Northern Affairs Communities are generally governed by an elected mayor and council. If the community is very small, as is the case for Aghaming, it may have only a contact person who works with the provincial government. First Nations are governed by a Chief and Council.

4.4.4 Land Ownership and Tenure

The majority of land in the Project Study Area is Crown land. The remaining Project Study Area is occupied by communities, including incorporated municipalities, First Nations, and Northern Affairs Communities. Commercial and residential land use in the Project Study Area is generally restricted to within the communities. The three First Nations have all recently undertaken the development of land use or community plans. There are no Community Interest Zones in the Project Study Area, and no Traditional Land Entitlement claims.

Development and zoning in Powerview-Pine Falls is the responsibility of the Winnipeg River Planning District. In Powerview-Pine Falls, land owners near the Project include Manitoba Hydro, Bluewater Land Ltd., Chevrefil Farms, Ray-Ann Transport, and a Roman Catholic Church. Protected areas in the Project Study Area include the Observation Point Wildlife Management Area, the Manigotagan River Provincial Park and several Areas of Special Interest. Other residences near the Project are in Manigotagan, where the Project passes approximately 900 m east of several residences on the east side of the community.

4.4.5 Resource Use

Traditional land use occurs in the Project Study Area and includes hunting, trapping, and plant gathering (ATK Interviews). Marten, fisher, beaver, otter, lynx, fox, coyote, and rabbit are important species for trapping. Rabbit is also a food source for some individuals in the community. Duck, goose, and partridge hunting also occurs in some communities. Plant gathering, particularly for medicinal purposes, includes namepin, or heartroot, and weekay, also known as ratroot or calamus. Other plants include red willow/dogwood, burdock, wild ginger, bull rushes, balsam sap, rice, spruce bark, mountain ash bark, juniper berries, blueberries, kinnickinnick, as well as woody species for firewood.

While domestic resource use occurs in the Project Study Area, it has likely decreased in relative importance to households compared to historical use. Activities such as trapping and wild rice harvesting still supplement diet and income. Other domestic resource use in the Project Study Area includes hunting, fishing, and plant gathering. Wild rice harvesting was formerly a common activity in the Project Study Area. Harvesting was originally for domestic purposes, but eventually became commercialized. Present day, wild rice harvesting is largely commercialized in the Project Study Area, but is highly dependent on market demand and weather conditions.

Commercial hunting, trapping, and fishing are common in the Project Study Area. Hunting and trapping are mostly supplementary livelihoods. Fluctuating market prices, based on weather and fashion, make trapping as a primary livelihood difficult (ATK Interviews). The Project Study Area is located in the Eastern Registered Trapline District and trapping is organized by the Hole River and Lac du Bonnet Registered Traplines. The most common trapped species are marten and beaver. Commercial fishing is an important economic activity in the Project Study Area, particularly for the three First Nations and the Northern Affairs communities located on the shore of Lake Winnipeg. Commercial fishers in the northern Project Study Area rely on the Wanipigow Fish Station in Hollow Water First Nation to deliver their catches.

The northern portion of the Project Study Area overlaps the edge of a region with many mining claims and exploration activities. There are numerous mining claims and quarry leases northwest and northeast of Manigotagan. There are several Quarry leases within the Project Study Area that are in close proximity to the Project. The Project crosses through one restricted mining area, east of the Observation Point Wildlife Management Area, and east of another restricted mining area south of Manigotagan.

Forestry was formerly an important part of the Project Study Area economy. However, since the closure of the Tembec mill, forestry is no longer as important an economic activity or common a livelihood in the Project Study Area.

4.4.6 Recreation and Tourism

Recreation is another important land use in the Project Study Area and includes canoeing, snowmobiling, sport hunting, and sport fishing. Canoe routes are primarily along Black River, Manigotagan River, and Wanipigow River (Tembec 2009). Snowmobile routes also often follow rivers in the area and are quite extensive and well connected. There are several cabins along

some of the canoe and snowmobiling routes. There is a cottage development underway in the Project Study Area, south of Black River First Nation, and two more under consideration west of Hollow Water and Sagkeeng First Nations. There is one lodge in the Project Study Area and one nearby in Bissett, offering activities such as boating, hiking, and guided fishing excursions. There are two outfitters operating in the vicinity of the Project Study Area, outfitting mainly for bear and both using existing forestry industry roads for access.

4.4.7 Heritage Resources

The archaeological record within the Project Study Area is best understood within the broader geographic region of the East Side of Lake Winnipeg. Registered archaeological sites found east of Lake Winnipeg indicate a longstanding history of use and occupation. Heritage resources with diagnostic characteristics combined with dating techniques have been applied to create a generalized chronology based on changing technologies (Table 4-8). Archaeological sites within the Project Study Area are representative of a timespan exceeding 8,000 years ago.

Table 4-8: Manitoba Chronology Based on Select Technology

	Archaeological Period	Technology	
		Container Type	**Food Procurement**
Post-European Contact Period	Late Historic Period (ca. 130 – 70 years ago.)	Porcelain Tableware Earthenware Dinnerware Stoneware Storage Jars Tin Cans	Repeating Rifles Cartridge Breach loading Shotguns
	Middle Historic Period (ca. 179 – 130 years ago.)	Earthenware Dinnerware Stoneware Storage Jars Copper Pots/Kettles	Breach Loading Rifles/Shotguns Percussion Cap Muskets
	Early Historic Period (ca. 360 – 179 years ago.)	Copper Pots/Kettles	Flintlock Muskets/Shotguns Projectile Points: Side-notched Metal
Pre-European Contact Period	Late Pre-contact Period (Woodland Tradition) (ca. 2,200 - 360 years ago.)	Clay Vessels: Selkirk Clearwater Lake Punctate Duck Bay Punctate Blackduck Laurel	Bow & Arrow Bone harpoons Nets Stone Projectile Points: Side-notched Eastern and Plains Triangular Avonlea Besant/Sonota
	Middle Pre-contact Period (Archaic ca. 8,000 - 2,500 years ago.)	Fibre Baskets/Bags Animal Viscera/Hide	Atlatl Bone harpoons, Nets Projectile Points: Larter Tanged/Pelican Lake Duncan/Hanna/McKean Old Copper Raddatz Oxbow
	Paleo-Indian Period (ca. 10,000 – 8,000 years ago.)	Fibre Baskets/Bags Animal Viscera/Hide	Spear Bone harpoons Projectile Points Agate Basin Plano

Three registered archaeological sites are located within the general Project Study Area: one pictograph site, and two campsites have been found along the Wanipigow and Black rivers. Two of these sites can be assigned to the Terminal Woodland Period, one of which includes a underlying occupation of Archaic materials. The pictograph site was not able to provide a definitive date.

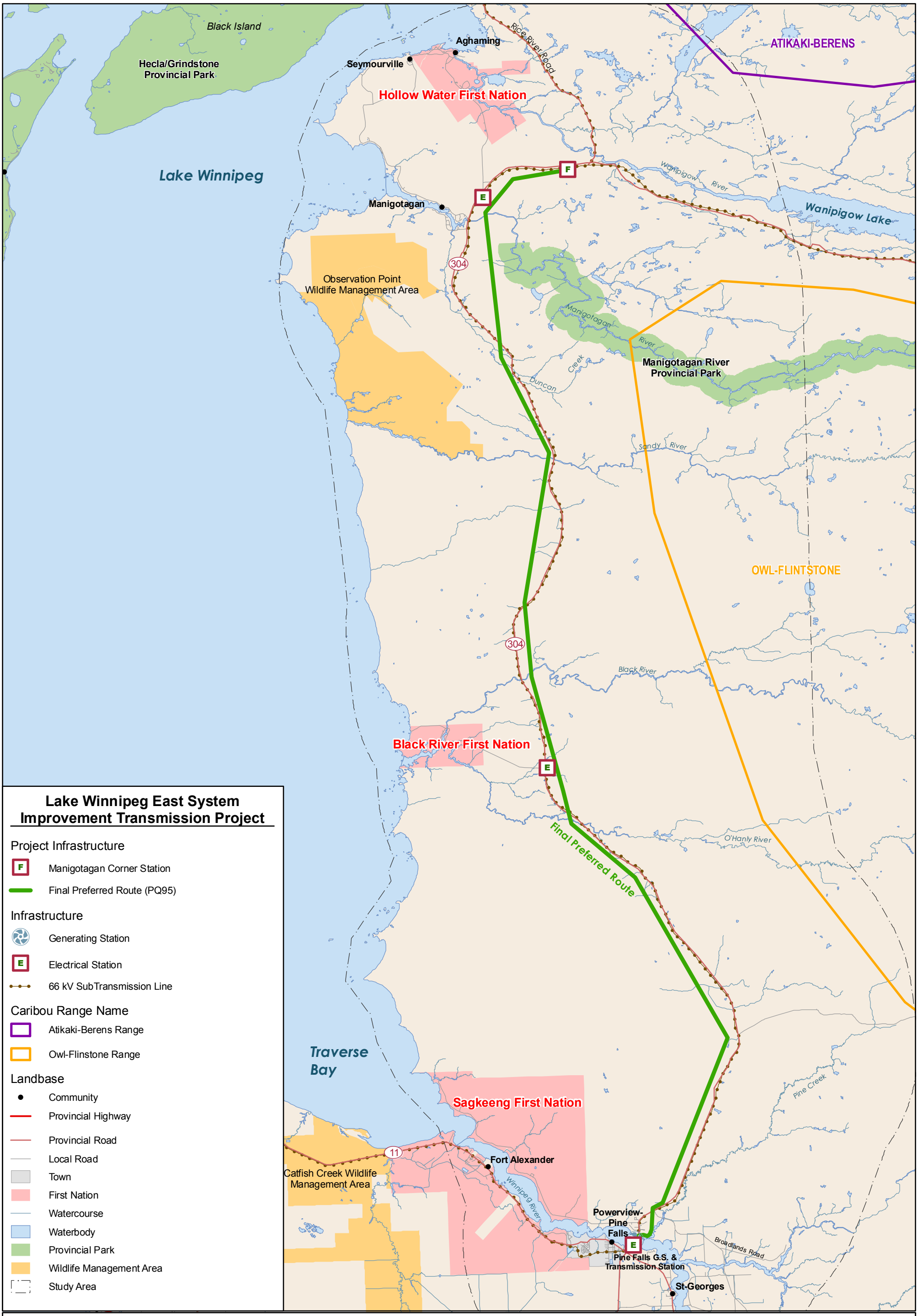
A more complete description of the existing environment with respect to heritage resources is provided by Northern Lights Heritage Services (2012a).

4.4.8 Cultural Resources

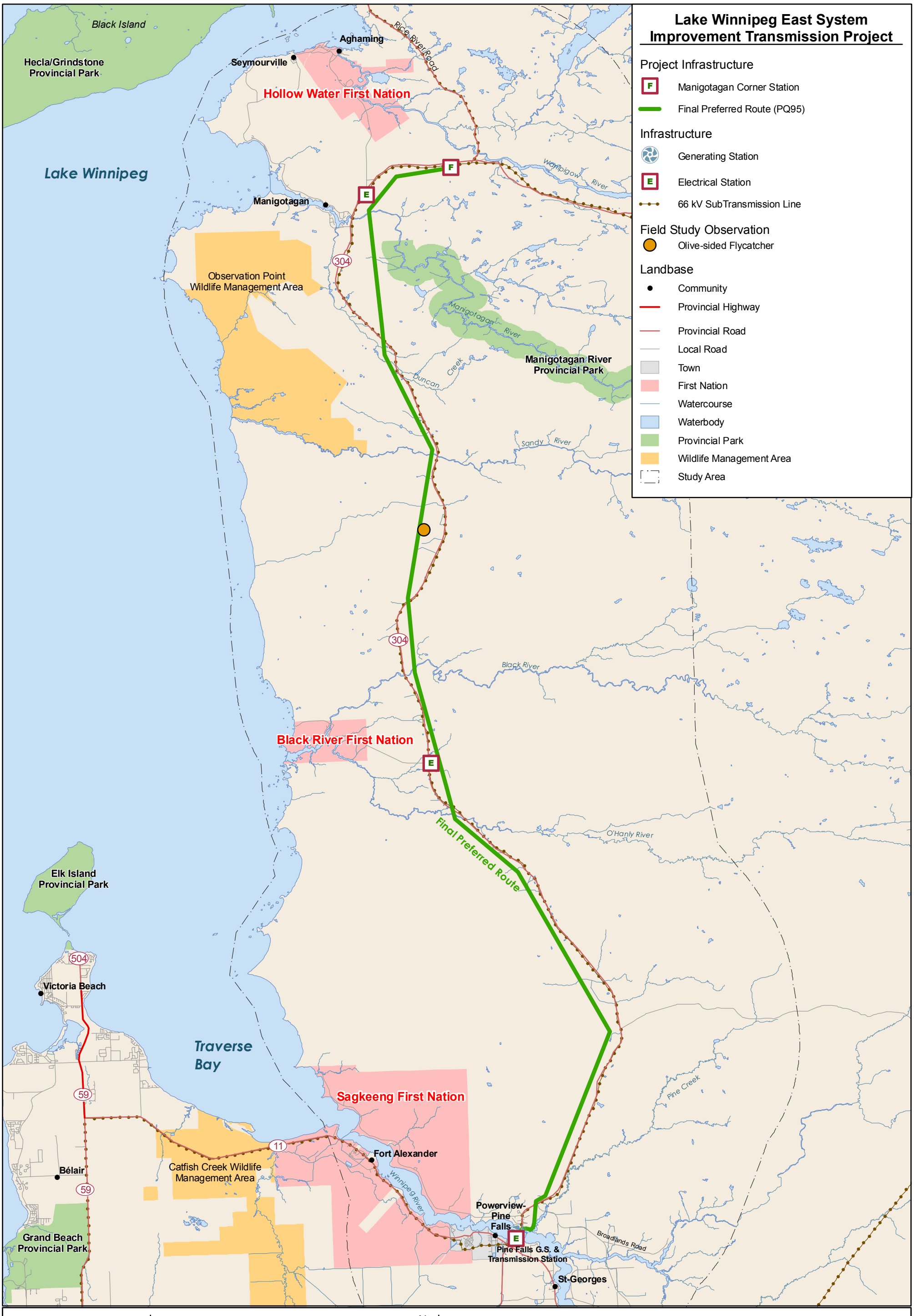
The First Nation communities of Sagkeeng (Treaty 1), Hollow Water and Black River (Treaty 5) are composed of indigenous people who refer to themselves as Anishinaabeg and who speak Anishinaabemowin. The Northern Affairs communities of Seymourville and Manigotagan are mainly composed of Metis who are closely associated with the First Nations through kinship, language and history. Metis people are recognized through self-identity, acceptance by the Metis community and by family ties to the historic period. From a cultural resources perspective, describing the existing environment is challenging because culture is dynamic.. ATK is part of an organic process that can be modified or adapted at any time by the holder depending on circumstances; “old ways” can be incorporated into the narrative of past experience or by purposely continuing with traditional methods. It is not so much the activity derived from ATK but rather it is the act of “doing” that is the essence of community knowledge.

The value of the long-term natural environment observations by Aboriginal and other people with close ties to the natural environment is important because it adds depth of knowledge and understanding of the relationship and interaction between humans and their living environment. Furthermore, the Aboriginal and local understanding of the complex web of relationships reminds us that the world is viewed in a holistic manner; what affects one component of the system has the ability to cause change elsewhere.

A more complete description of the existing environment with respect to cultural resources is provided in Northern Lights Heritage Services (2012b).


Black Island
Hecla/Grindstone Provincial Park
Lake Winnipeg
Aghaming
Seymourville
Rice River Road
Hollow Water First Nation
ATIKAKI-BERENS
F
E
Manigotagan
Wanipigow River
Wanipigow Lake
304
Observation Point Wildlife Management Area
Manigotagan River
Manigotagan River Provincial Park
Duncan Creek
Sandy River
OWL-FLINTSTONE
304
Black River
Black River First Nation
E
Final Preferred Route
O'Hanly River
Traverse Bay
Sagkeeng First Nation
Pine Creek
11
Fort Alexander
Catfish Creek Wildlife Management Area
Winnipeg River
Powerview-Pine Falls
E
Broadlands Road
Pine Falls G.S. & Transmission Station
St-Georges
Lake Winnipeg East System Improvement Transmission Project
Project Infrastructure
F Manigotagan Corner Station
Final Preferred Route (PQ95)
Infrastructure
Generating Station
E Electrical Station
66 kV SubTransmission Line
Caribou Range Name
Atikaki-Berens Range
Owl-Flinstone Range
Landbase
Community
Provincial Highway
Provincial Road
Local Road
Town
First Nation
Watercourse
Waterbody
Provincial Park
Wildlife Management Area
Study Area
Manitoba Hydro
Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN,
Date Created: December 19, 2012
N
0 6 12 Kilometres
0 4 1:200,000 8 Miles
Boreal Woodland Caribou Range in Relation to the Project Study Area
Map 4 - 1

Lake Winnipeg East System Improvement Transmission Project



Project Infrastructure

- Manigotagan Corner Station
- Final Preferred Route (PQ95)

Infrastructure

- Generating Station
- Electrical Station
- 66 kV SubTransmission Line

Field Study Observation

- Olive-sided Flycatcher

Landbase

- Community
- Provincial Highway
- Provincial Road
- Local Road
- Town
- First Nation
- Watercourse
- Waterbody
- Provincial Park
- Wildlife Management Area
- Study Area

Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN, WRCS
Date Created: December 19, 2012

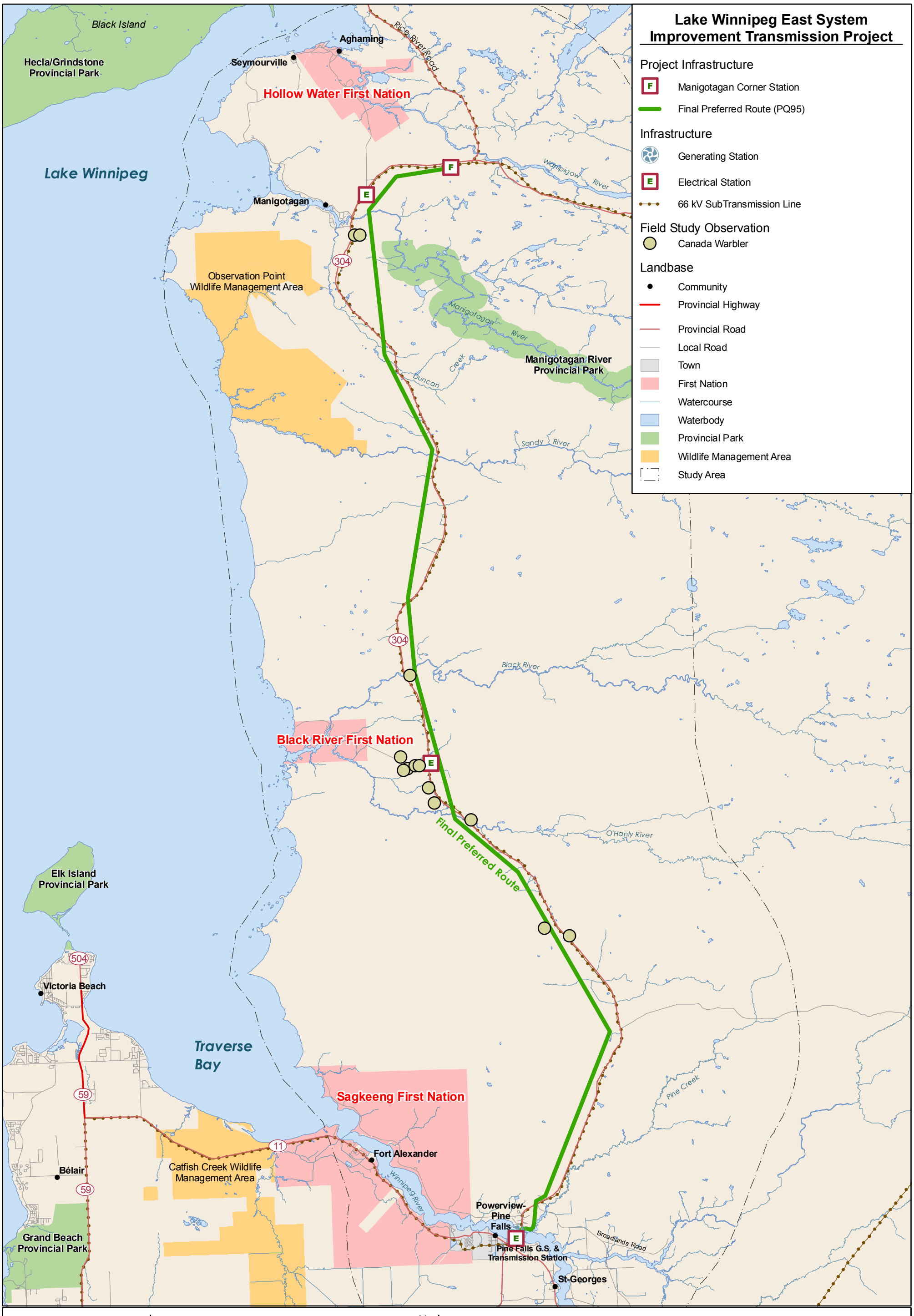
N

0 6 12 Kilometres

0 4 1:200,000 8 Miles

Olive-sided Flycatcher Observation During Field Studies

Map 4 - 2


Lake Winnipeg East System Improvement Transmission Project
Project Infrastructure
Manigotagan Corner Station
Final Preferred Route (PQ95)
Infrastructure
Generating Station
Electrical Station
66 kV SubTransmission Line
Field Study Observation
Canada Warbler
Landbase
Community
Provincial Highway
Provincial Road
Local Road
Town
First Nation
Watercourse
Waterbody
Provincial Park
Wildlife Management Area
Study Area
Black Island
Hecla/Grindstone Provincial Park
Aghaming
Seymourville
Hollow Water First Nation
Rice River Road
Lake Winnipeg
Manigotagan
Observation Point Wildlife Management Area
Manigotagan River Provincial Park
Manigotagan River
Duncan Creek
Sandy River
Winnipegosis River
304
Black River
Black River First Nation
O'Hanly River
Elk Island Provincial Park
504
Victoria Beach
Traverse Bay
59
Sagkeeng First Nation
11
Fort Alexander
Bélair
Catfish Creek Wildlife Management Area
Winnipeg River
Powerview-Pine Falls
Pine Falls G.S. & Transmission Station
Broadlands Road
St-Georges
Pine Creek
Grand Beach Provincial Park
Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN, WRCS
Date Created: December 19, 2012
N
0 6 12 Kilometres
0 4 1:200,000 8 Miles
Manitoba Hydro
Canada Warbler Observations During Field Studies
Map 4 - 3

Lake Winnipeg East System Improvement Transmission Project

Project Infrastructure

- Manigotagan Corner Station
- Final Preferred Route (PQ95)
- Alternative Route A
- Alternative Route B
- Alternative Route C

Infrastructure

- Generating Station
- Electrical Station
- 66 kV SubTransmission Line

Natural Ecological Region

- Lac Seul Upland - 371 - Wrong Lake Ecodistrict
- Lake of the Woods - 375 - Stead Ecodistrict

Landbase

- Community
- Provincial Highway
- Provincial Road
- Local Road
- Protected Area
- Town
- First Nation
- Watercourse
- Waterbody
- Provincial Park
- Wildlife Management Area
- Study Area

Black Island
Hecla/Grindstone Provincial Park
Aghaming
Seymourville
Rice River Road
Hollow Water First Nation
Lake Winnipeg
Wanipigow River
Manigotagan
Observation Point Wildlife Management Area
304
Manigotagan River
Manigotagan River Provincial Park
Duncan Creek
Alternative Route C
Alternative Route B
Sandy River
Black River
371
Black River First Nation
Alternative Route A
Final Preferred Route
O'Hanly River
Elk Island Provincial Park
504
Victoria Beach
Traverse Bay
59
Sagkeeng First Nation
11
Fort Alexander
Winnipeg River
375
Bélair
Catfish Creek Wildlife Management Area
Grand Beach Provincial Park
Powerview-Pine Falls
Pine Falls G.S. & Transmission Station
Broadlands Road
St-Georges

INSET B
Scale 1:100,000

Hollow Water First Nation
Wanipigow River
Rice River Road
304
Manigotagan Corner Station
Manigotagan
Manigotagan River

INSET A
Scale 1:75,000

304
Broadlands Road
Powerview-Pine Falls
Pine Falls G.S. & Transmission Station
11

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: December 19, 2012

N

0 6 12 Kilometres
0 4 8 Miles
1:200,000

Manitoba Hydro

Ecoregions and Ecodistricts

Map 4 - 4

5.0 PUBLIC ENGAGEMENT

5.1 PURPOSE AND OBJECTIVES

Public and stakeholder engagement is an integral part of Manitoba Hydro's SSEA process. Manitoba Hydro developed a two-round Public Engagement Program (PEP) to guide engagement for the LWESI Project. The approach reflects the experience of Manitoba Hydro's current practices and principles for consultation in a SSEA context.

The overall purpose of the program was to provide the public, in particular those who may be directly or indirectly affected by the Project, with meaningful opportunities to receive information on, and provide their input into, the SSEA for the Project. The program aimed to achieve the following with respect to such interested parties:

- Opportunities for early involvement – this includes providing early notice and information about the Project so that parties can assess their interests and provide early comment, as well as become involved in ongoing planning and environmental review activities.
- Opportunities for ongoing involvement – this includes providing ongoing opportunities to learn about the Project and key planning activities, to provide input with respect to any concerns or opinions, to resolve issues raised, to have views and inputs recorded, and to learn about actions that occur as a result of studies and planning activities.
- Opportunities at various stages – this includes opportunities to provide inputs: a) when issues are being initially identified; b) when alternative routes/sites are being considered; c) when initial effects are described, mitigation measures identified and ways to enhance positive effects are considered; d) when the Environmental Assessment (EA) Report has been filed with regulators for review and comment.
- Variety of mechanisms – this includes a variety of tools to communicate, to receive feedback and to engage in ongoing meaningful dialogue.
- Adaptive approach – this includes adjusting the program, as required and feasible, throughout the course of the planning, environmental assessment and review process, in response to issues, concerns and challenges.

A preliminary list of stakeholders was developed prior to Round 1 engagement activities. Additional stakeholders were identified throughout the environmental assessment process. Stakeholders were classified into three groups that determined the nature of engagement activities.

5.2 METHODS

The Public Engagement Program utilized a variety of methods to involve and engage communities and the general public to inform them about, and provide input into the project. The

PEP was developed to provide a mechanism to identify how individuals, communities, interested stakeholder groups and the environment could potentially be affected by the project and to identify potential mitigation measures. In particular, the PEP sought to fill gaps in scientific knowledge through the collection of ATK and local knowledge from peoples engaged on the land. Public input was a key consideration in the identification of a preferred transmission line route.

The PEP involved two rounds of engagement. Round 1 included presentations to stakeholder groups identified in Section 5.2.1 as well as holding open houses in communities in the Project Study Area. Presentations and open houses provide background information on the project and solicited input on potential effects (to the environment and/or to the individual or group), and preference for 1 of the 3 alternative routes (or segments of individual alternative routes). Round 2 also involved presentations (to those stakeholder groups that requested a follow up presentation after the conclusion of Round 1) and open houses. At this stage, the preferred route was presented and input solicited as in Round 1. In addition, ATK workshops and a meeting with Elders in one First Nation community were held.

5.2.1 Community Leadership and Key Landowners

The Project Study Area contains the following eight (8) communities, listed from south to north are as follows:

- Sagkeeng First Nation;
- Town of Powerview-Pine Falls;
- Rural Municipality of Alexander;
- Black River First Nation;
- Community of Manigotagan;
- Community of Seymourville;
- Hollow Water First Nation; and
- Community of Aghaming.

The Project also falls within the Manitoba Métis Federation southeast region. Appendix 2 lists, in alphabetical order, the contact person and title for the community representatives.

5.2.2 Organizations and Regulatory Authorities

There were nineteen (19) community advisory committees, local and provincial groups or associations, non-government organizations and regulatory authorities identified for involvement in the PEP. They are listed within the First Nation Advisory Committees and Organizations classifications in Appendix 2, which also provides the contact person and their title.

5.2.3 Other Stakeholders

There were twenty eight (28) private landowners, businesses, rights holders and land use groups, in the Project area, that were identified for involvement in the PEP. They are listed within the Private Land and Rights Holders classification in Appendix 2, which provides the contact person and their title and includes the two landowners discussed in Section 5.2.1.

5.3 ENGAGEMENT MATERIALS AND ACTIVITIES

This section describes the materials that were developed for the PEP and the associated activities that were conducted. The LWESI Project, Public Engagement Program Technical Report (Maskwa et al. 2012) provides copies of the materials used and summarizes the feedback that was received.

5.3.1 Open Houses

There were two Rounds of Open House meetings conducted in the communities located within the Project area. The Open House meetings featured storyboards that described and explained the project and also provided the informational material described in Sections 5.3.2, 5.3.4 and 5.3.5. The purpose of the Open House meetings was:

- To provide information on the Project;
- To provide information on the environmental assessment process;
- To receive input on the alternative and preferred transmission line routes being considered;
- To provide information on ‘What We Heard” through the Round 1 engagement process;
- To provide information on the assessment of alternative routes and the selection of the preferred route (Round 2); and
- To provide an opportunity to provide comments and discuss concerns.

Table 5-1 lists the Open House meetings that were conducted for the PEP.

Table 5-1: Open House Meetings

Engagement Period	Date	Location	Time
Round 1	July 24, 2012	Hollow Water First Nation Community Hall	2:00 PM to 8:00 PM
	July 26, 2012	Sagkeeng First Nation Arena Multiplex	10:00 AM to 8:00 PM
	July 30, 2012	Papertown Motor Inn, Powerview/Pine Falls Mb.	2:00 PM to 8:00 PM
	July 31, 2012	Manigotagan Community Hall, Manigotagan Mb.	2:00 PM to 8:00 PM
	Aug. 8, 2012	Black River First Nation Band Office	2:00 PM to 8:00 PM
Round 2	Oct. 1, 2012	Papertown Motor Inn, Powerview/Pine Falls Mb.	2:00 PM to 8:00 PM

Table 5-1: Open House Meetings

Engagement Period	Date	Location	Time
	Oct. 4, 2012	Hollow Water First Nation Community Hall	2:00 PM to 8:00 PM
	Oct. 10, 2012	Black River First Nation Band Office	2:00 PM to 8:00 PM
	Oct. 11, 2012	Seymourville Community Hall, Seymourville Mb.	2:00 PM to 8:00 PM

5.3.2 Comment Forms

Two comment forms were developed to solicit input during Round 1 and 2. They were distributed and made available during Open Houses, community and stakeholder meetings, and ATK workshops.

The comment sheets were produced in an 11" X 17" format with a map of the alternative routes or the alternative and preferred routes, for Round 1 and 2 respectively, on one side. The reverse side solicited input on the public engagement process and the Project and more specifically requested participants to identify areas of concern for the alternative or preferred routes, in written format or drawn on the attached map.

5.3.3 Meetings

There were two Rounds of meetings conducted with local community leaders/administrators and their designates, regulatory authorities and stakeholders. In Round 1, Manitoba Hydro sent introductory letters to all Communities, Towns and Organizations, as classified in Appendix 2, informing them of the Project and offering an opportunity to meet and share information, have questions answered and discuss the proposed Project. The letters were followed up with a telephone call to determine the level of interest in the Project and to schedule an informational meeting, when requested.

In Round 2, meetings were held with all participants from Round 1 that indicated a desire for a follow-up meeting as well as with community groups or stakeholders that expressed an interest during Round 2 activities.

The meetings used PowerPoint presentations that provided information on the Project need and its components, the SSEA components and process, opportunities for involvement in the PEP, the *Manitoba Environment Act* licensing process, timeframes for the SSEA and the overall Project, "What We Heard" during Round 1, and maps of the alternative and preferred routes for Round 1 and 2, respectively.

The presentations were followed by a discussion and question and answer period, which was documented and reported on in the Public Engagement Program Technical Report (Maskwa et al. 2012). Copies of the Round 1 or 2 newsletters and comment sheets were provided to

meeting participants and printed or digital copies of the PowerPoint presentations were provided, when requested.

Table 5-2 lists the community and stakeholder meetings that were conducted for the PEP.

Table 5-2: Community and Stakeholder Meetings

Engagement Period	Date	Community/Stakeholder
Round 1	June 20, 2012	Manitoba Model Forest – Board of Directors
	June 26, 2012	Rural Municipality of Alexander
	June 28, 2012	Manitoba Model Forest – Committee for Cooperative Moose Management
	June 28, 2012	Seymourville Community Council
	July 5, 2012	Manitoba Eco-Network
	July 10, 2012	MCWS, Eastern Region
	July 10, 2012	Town of Powerview- Pine Falls Council
	July 11, 2012	Hollow Water First Nation Chief and Council
	July 11, 2012	Manitoba Wildlife Federation & Manitoba Trappers Association
	July 12, 2012	Manitoba Wildlands
	July 20, 2012	Sagkeeng First Nation Chief and Council
	July 27, 2012	Black River First Nation Chief and Council
	July 27, 2012	Waabanong Anishinaabe Interpretive Learning Centre - Board of Directors
	Aug. 8, 2012	Black River First Nation Traditional Area Advisory Committee
	Aug. 21, 2012	Hollow Water First Nation Traditional Area Advisory Committee
Round 2	Sept. 10, 2012	MCWS, Eastern Region
	Sept. 13, 2012	Manitoba Model Forest – Committee for Cooperative Moose Management
	Sept 19, 2012	Black River First Nation Chief and Council
	Sept 26, 2012	Manitoba Eco-Network
	Sept 28, 2012	Waabanong Anishinaabe Interpretive Learning Centre - Board of Directors
	Oct 2, 2012	Mining Association of Manitoba
	Oct 4, 2012	Hollow Water First Nation Chief and Council
	Oct 4, 2012	Hollow Water First Nation Traditional Area Advisory Committee
	Oct 10, 2012	Black River First Nation Traditional Area Advisory Committee
	Oct 18, 2012	Hollow Water First Nation Elders
	Oct 30, 2012	Town of Bissett/San Gold Corp.

5.3.4 Project Newsletters

Newsletters were produced for Round 1 and 2 of the PEP. They were mailed to all representatives and stakeholders, identified in Appendix 2, as part of the Project notification process. The newsletters were also made available during all Open Houses, community and stakeholder meetings and ATK workshops.

The Round 1 newsletter (July 2012) provided an overview of the Project, the SSEA process, the PEP, displayed a map of the alternative routes, invited people to the Round 1 Open Houses and provided contact information for the Manitoba Hydro Project representative (Maskwa et al. 2012).

The Round 2 newsletter (September 2012) provided the same Project and SSEA overview provide in the Round 1 newsletter and summarized the Round 1 PEP activities and the primary comments or concerns that were expressed in Round 1, along with the Manitoba Hydro response to the concerns Maskwa et al. 2012. The Round 2 newsletter also displayed the preferred route map, invited people to the Round 2 Open Houses and provided contact information for the Manitoba Hydro Project representative.

5.3.5 Information Packages

In addition to the comment forms and newsletters described in Sections 5.3.2 and 5.3.4, respectively, the PEP provided the Manitoba Hydro brochures titled “Transmission Right of Way, Tree Clearing and Maintenance” and “Trapper Notification / Compensation Policy”. Map products were also developed to facilitate discussions on the alternative and preferred routes and their site-specific locations.

In Round 1, poster maps, at a scale of 1:150,000, were developed that displayed the alternative routes in relation to the landbase features in the Project area, including Community and Registered Traplines. Map series folios, at a scale of 1:20,000, displaying the alternative routes were developed on orthophotographs to allow individuals to visually identify geographic and other features intersected by or in proximity to the alternative routes. In Round 2, the same map products were produced but the preferred route was added, which allowed comparison of the preferred route to the alternative routes.

5.3.6 Open House Advertisements

Open Houses were advertised using newspaper and radio advertisements and through posters erected throughout the local communities. Advertisements were placed in local weekly and provincial monthly newspapers prior to each Round of Open Houses. When Open House and newspaper publication schedules allowed, weekly advertisements were run for two weeks prior to the Open Houses. Local radio station advertisements were also used to advertise the Round 1 Open Houses. Posters advertising the specific Open House(s), scheduled to be held in the vicinity of the community, were erected on public bulletin boards throughout the communities.

5.3.7 First Nations and Aboriginal Engagement

Meetings were held with First Nation Chiefs and Councils and their designated Traditional Area Advisory Committees, as described in Section 5.3.3. The Public Engagement Program also organized five (5) ATK workshops, which are reported on in the Project, Cultural Resources Technical Report (NLHS 2012a). A community request, originating from an ATK workshop, resulted in an additional meeting that was conducted in Ojibway with an Elders group in Hollow Water First Nation (Section 5.3.3). After the first round of engagement, Sagkeeng First Nation declined to participate in the 2nd round.

The Manitoba Métis Federation was contacted during each round; however, a response was never received. Therefore, no meetings were conducted with the Manitoba Métis Federation.

5.4 PUBLIC ENGAGEMENT FEEDBACK

Public input and comments were documented for each round of the Public Engagement Program through comment sheets, letters received from individuals or by recording (i.e., writing down) questions, comments or concerns that were expressed by the public at the presentation meetings and open houses. This section provides a summary of the feedback received throughout the PEP. A more detailed description, as well as the responses by Manitoba Hydro to key concerns and issues is detailed in the LWESI Project, Public Engagement Program Technical Report (Maskwa et al. 2012) Feedback included comments on the location of the transmission route relative to PR #304, effects on land use activities, effects on private land and business owners, ROW transmission line maintenance, and job opportunities and training.

5.4.1 Round One – General Feedback Summary

During Round 1, three alternative transmission routes were presented to the public. Comments received or heard during presentation meetings and at open houses generally involved a desire by the public to locate the preferred route closer to PR #304 rather than creating a new corridor farther away from the highway. This was also closely related to another concern: the potential for increased hunting opportunities (particularly for moose). Individuals and groups expressed concern that a new transmission ROW farther away from the highway could facilitate increased pressure on the moose population (which is currently very low and for which significant efforts are being taken to increase the moose population in the region). Stakeholder groups suggested that by keeping the ROW closer to the highway, moose hunting opportunities would be reduced. Individuals also expressed concern about how the project would affect other land use activities, including trapping and the use of medicinal plants in the project footprint areas. One of the alternative routes also would cross a river in close proximity to a First Nation community youth trap line cabin.

Concerns about the effects of the transmission line route on private land owners were only identified for the area between the Pine Falls Generating Station and immediately north of Broadlands Road. Concerns were raised by one private land owner regarding the potential effect of the alternative routes on the value of their agricultural lands, as well as the effect of the

transmission line and tower structures on potential, future development plans. In addition, a business owner expressed concern about the potential effects of one alternative route on their current business, and plans for expanding their recreational business opportunities, which are currently underway.

Feedback was also received regarding maintenance activities for the transmission ROW. In particular, communities were opposed to the use of herbicides for controlling vegetation in ROWs. The communities expressed support for mechanical means of controlling tree growth, and for employing methods that would encourage the growth of low-growing plants and shrubs in the ROW.

There was significant interest expressed by individuals and communities in employment opportunities created by the project and also for potential training opportunities. In particular, Aboriginal communities wanted to ensure that their communities had opportunities for employment in the construction phase of the project.

5.4.2 Round Two – General Feedback Summary

Round 2 of the Public Engagement Program presented the public with the preferred route option. The preferred route utilizes segments of each of the three alternative routes and provides an option which follows PR #304 as closely as possible. Feedback from stakeholder groups was very positive, as the Preferred Route followed two key recommendations expressed by the public in Round 1: keep the transmission route closer to PR #304, and minimize hunting opportunities. In addition, the Preferred Route chosen also avoided the youth trap line cabin identified during Round 1.

Concerns were expressed again in Round 2 by the private land owner and business owner identified in Round 1. As a result, Manitoba Hydro investigated options for the transmission line routing that the private land owner suggested. In addition, a business owner immediately north of the Pine Falls Generating Station expressed concern again about the potential effects of the transmission line on their business and a planned business expansion. Manitoba Hydro has been working with the business owners to address their concerns. The consideration and evaluation of options proposed by the two landowners and the adjustments to Preferred Route to are discussed in Section 6.1.4 and 6.1.3 respectively.

Communities identified several opportunities that the project could create. As in Round 1, individuals and communities identified employment and training opportunities as being very important. In addition, several communities inquired about the ability of the new transmission towers to carry fibre optic lines, which could be potentially extended into the communities. Manitoba Hydro is investigating this.

Finally, two communities expressed interest in having access to the environmental assessment and technical reports for the project. In particular, the communities requested that Manitoba Hydro come to the communities to present the results of the investigations and the EA Report. Manitoba Hydro agreed to provide presentations on the EA Report to communities that request a presentation.