Manitoba-Minnesota Transmission Project
Pre-Application Project Description

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Manitoba Hydro

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1 Introduction

1.1 Summary of the Project

Manitoba Hydro is proposing to construct and operate a 500 kV alternating current international power line ("IPL") extending from Manitoba Hydro's Dorsey Converter Station in Manitoba to the international boundary between Manitoba and Minnesota ("Dorsey IPL"). Manitoba Hydro's proposed route for the IPL crosses privately owned land, provincial Crown land and land that is either owned or under easement by Manitoba Hydro. The Dorsey IPL will connect with the Great Northern Transmission Line, a new 500 kV transmission line in the United States that is proposed to be constructed by Minnesota Power, an operating division of Allete Inc. Based on the proposed design and route, the construction of the Dorsey IPL will require alterations to two of Manitoba Hydro's existing IPLs, as well as alterations to some of Manitoba Hydro's intra-provincial transmission lines and facilities. The construction of the Dorsey IPL and the associated alterations to Manitoba Hydro's existing transmission facilities is collectively known as the Manitoba-Minnesota Transmission Project ("MMTP" or "Project").

The Project is required in order to: (i) deliver contracted quantities of electricity to and from the United States pursuant to recently executed electricity exchange agreements with Minnesota Power; (ii) improve reliability of supply to Manitoba customers by increasing transmission capacity for imports during times of drought and other emergencies; (iii) increase Manitoba Hydro's capacity to participate in organized electricity markets in the United States. Based on contractual commitments with Minnesota Power, the proposed in-service date is May 31, 2020. Construction is currently scheduled to commence in the summer of 2017.

1.2 Description of Proponent

Manitoba Hydro is a provincial Crown Corporation established and governed by *The Manitoba Hydro Act*, (R.S.M. 1987, c.H190). Headquartered in Winnipeg, Manitoba Hydro owns and operates electric generation, transmission and distribution facilities and is the province's sole retail electricity supplier, serving 561,000 electric customers throughout Manitoba. As one of the largest integrated electricity and natural gas distribution utilities in Canada, Manitoba Hydro employs more than 6,500 people, has assets approaching $17 billion and annual revenues of more than $2.8 billion. Manitoba Hydro is administered by the Manitoba Hydro-Electric Board appointed by order of the Lieutenant-Governor in Council. Consistent with the stated purposes of *The Manitoba Hydro Act*, Manitoba Hydro's Corporate Mission is *"To provide for the continuance of a supply of energy to meet the needs of the province and to promote economy and efficiency in the development, generation, transmission, distribution, supply and end-use of energy"*.

Additional information can be found on the corporate website at https://www.hydro.mb.ca/.

1.3 Federal Requirements

1.3.1 Federal Authorizations/Notice Required Prior to Construction

National Energy Board Act (R.S.C. 1985, c.N-7)

Manitoba Hydro intends to file an application with the National Energy Board ("NEB" or the "Board") for: (i) a permit to construct and operate the Dorsey IPL pursuant to Section 58.11 of the *National Energy*

Board Act; (ii) authorization to modify the Glenboro IPL pursuant to Condition 13 of Permit EP-196; (iii) authorization to modify the Riel IPL pursuant to Condition 8 of Certificate of Public Convenience and Necessity EC-III-16. An Order-in-Council was issued by the Lieutenant Governor of the Province of Manitoba on November 6, 2013 pursuant to sections 58.2 and 58.17 of the *National Energy Board Act* designating the Minister of Conservation and Water Stewardship as the provincial regulatory agency for the Project. Provincial proceedings for the Project have been initiated as described in more detail below.

Canadian Environmental Assessment Act, 2012 (S.C. 2012, c.19, s.52)

Since the Dorsey IPL exceeds 345 kV and requires more than 75 km of new right of way, the Project is a "designated project" pursuant to the Regulations Designating Physical Activities (SOR/2012-147) under the *Canadian Environmental Assessment Act, 2012* ("*CEAA, 2012*"). Pursuant to subsection 15(b) of *CEAA, 2012*, the NEB is the Responsible Authority for certain designated projects regulated under the *National Enery Board Act* (R.S.C., 1985, c. N-7), and will be the authority responsible for the federal review of the Project under *CEAA, 2012*. Accordingly, no separate authorization from the Canadian Environmental Assessment Agency is required.

Explosives Regulations, 2013 (SOR/2013-211)

Manitoba Hydro has all of the reuired magazine licences for the Project and its contractor holds an import permit for import of the required explosives. An amdnement to section 178 of these regulations effective February 1, 2016 will require an approval letter from the Chief Director of Explosives or equivalent documentation for employees or contractors who have access to high hazard explosives used in the Project.

International Boundary Commission Act (R.S.C. 1985, c.I-16)

Authorization from the International Boundary Commission is required to place the Dorsey IPL within ten feet of the international boundary pursuant to section 5 of the Act.

Aeronautics Act (R.S.C. 1985, c.A-2)

Manitoba Hydro must provide notice to the Minister of Transport of the construction of the Dorsey IPL pursuant to section 601.24 of the Canadian Aviation Regulations (SOR 96-433) regarding obstacles to navigation.

1.3.2 Other Federal Requirements

No other federal authorizations are anticipated by Manitoba Hydro to be required prior to construction of the Project. While the *Fisheries Act* (R.S.C. 1985, c.29) and the *Species at Risk Act* (S.C. 2002, c.29) have potential application to the Project, Manitoba Hydro has designed the Dorsey IPL to avoid serious harm to fish and fish habitat caused by IPL water crossings and does not anticipate that authorizations under these statutes will be necessary. However, based on the Memorandum of Understanding in place between the Board and Fisheries and Oceans Canada, Manitoba Hydro understands that the Board's review of Manitoba Hydro's application may result in a determination that authorizations under these Acts are necessary.

As outlined in Appendix A to this Pre-Application Project Description ("Project Description"), several pieces of federal legislation have general application to the Project and have been used by Manitoba

Hydro as guidance during the course of developing the proposed design and route for the Project. For instance, with respect to the *Migratory Birds Convention Act* and the *Species at Risk Act* for terrestrial species, the Project has been designed to avoid sensitive locations and time periods as much as possible. The Project has also been designed to avoid any Indian Reserves, national parks or national protected areas, areas of natural or historical significance to the nation, national historic sites, historic canals, historic museums established under the *Historic Sites and Monuments Act* (R.S.C., 1985, c. H-4), federal heritage buildings, historic places in Canada, or federal archaeology. The referenced federal legislation in Appendix A also prescribes various notifications and other requirements that must be followed during implementation of the construction phase of the Project and will be instrumental in developing mitigation measures.

1.4 Provincial Requirements

1.4.1 Provincial Authorizations Required Prior to Construction

The Public Utilities Board Act (C.C.S.M. c.P280)

On April 17, 2013 the Province of Manitoba issued Order-in-Council 128/2013 requiring the Public Utilities Board of Manitoba to conduct a Needs For and Alternatives To ("NFAT") review of Manitoba Hydro's proposed preferred development plan, which included the construction of Keeyask Generating Station, Conawapa Generating Station and the proposed 500 kV Dorsey IPL.

The Manitoba Hydro Act (C.C.S.M. c.H190)

Subsection 16(1) of the Act requires Manitoba Hydro to obtain approval of the Lieutenant Governor in Council for the acquisition of interconnection works.

The Environment Act (C.C.S.M. c.E125)

The construction of transmission lines greater than 230kV and associated facilities is a Class 3 Development pursuant to the Classes of Development Regulation (M.R. 164/88) under *The Environment Act* and is subject to licensing under section 12 of the Act. Class 3 Developments typically include a public hearing facilitated by the Clean Environment Commission ("CEC"), an "arms length" provincial government agency.

1.4.2 Other Provincial Requirements

As outlined in Appendix A, several other Provincial statutes have application to the type of undertakings required for the Project. Manitoba Hydro intends to obtain permits under these statutes during the construction and/or operational phase of the Project, even though Manitoba Hydro may not be legally bound to do so as an agent of the Crown. Numerous Provincial statutes have also been used as guidance in the development of the Project or in the development of mitigation measures, as also outlined in Appendix A.

1.5 Status of Project

Engagement Processes:

- Manitoba Hydro's Public Engagement Process for the Project began in June of 2013. A pre-engagement phase followed by four rounds of extensive pre-regulatory engagement has been completed.

- Manitoba Hydro's First Nation and Métis Engagement Process began in August of 2013 and is on-going, as described in section 5 of this Project Description.

Public Utilities Board Act Approval:

- Following completion of the required NFAT review, including a public hearing from March 3rd to May 26th, 2014, the Public Utilities Board of Manitoba issued a report confirming the need for the new Manitoba-Minnesota interconnection and recommending that Manitoba Hydro be given approval to proceed with plans to construct the 500 kV Manitoba-Minnesota transmission interconnection project.

Manitoba Hydro Act Approval:

- On December 10, 2014 the Province of Manitoba issued Order-in-Council 545/2014 authorizing Manitoba Hydro to take all necessary actions for the construction and operation of a new 500 kV interconnection between Manitoba and Minnesota.

The Environment Act Approval:

- On November 21, 2014, Manitoba Hydro submitted an Environment Act Proposal for the Project with Manitoba Conservation and Water Stewardship ("MCWS"). The submission included a draft Scoping Document that described the proposed scope ond content of the environmental impact statement ("EIS").
- On January 8, 2015 MCWS published the Proposal on its website and the public was given until February 9, 2015 to provide comments. During this time the proposal was also reviewed by a provincial Technical Advisory Committee (TAC) composed of experts from provincial departments with knowledge and expertise on the potential issues.
- On April 24, 2015, MCWS posted the results of the TAC/public review on their website (http://www.gov.mb.ca/conservation/eal/registries/5750mbhydrombminnesota/index.html), and on May 5, 2015 MCWS provided Manitoba Hydro with a letter with instructions on the revisions required for the draft Scoping Document, based on the TAC/public review process.
- On June 24, 2015 MCWS posted the final Scoping Document to their website defining the scope and contents of the EIS.
- Manitoba Hydro filed the Environmental Impact Statement ("EIS") for the Project with MCWS on September 22, 2015.
- Filing of the EIS triggers the provincial environmental review of the Project, which will include a public hearing facilitated by the CEC if ordered by the Minister of Conservation and Water Stewardship, followed by a report containing recommendations from the CEC to the Minister.
- Crown consultations by the Province of Manitoba commenced in July of 2015. When complete, a report concerning Crown consultations will be provided to the Minister prior to the Minister's decision to issue a licence for the Project.
- Following Board approval, authorization from the International Boundary Commission will be sought.

1.6 Linkages to the Environmental Impact Statement

Additional detail supporting the information in this Project Description can be found in the EIS, filed with MCWS on September 22, 2015 and located on the Project website:

https://www.hydro.mb.ca/projects/mb_mn_transmission/regulatory_filings.shtml

The following is a list of locations in the EIS that address the various Pre-Application Project Description information requirements:

- The nature of the project and its components - EIS Volume 1, Chapter 2;
- The nature of the lands to be crossed or impacted (including privately-owned, Crown lands and Aboriginal traditional territories) – EIS Volume 3, Chapter 11;
- Project location relative to potentially affected communities and Aboriginal groups – EIS Volume 1, Chapter 4;
- A list of the Aboriginal groups contacted and consulted, including how those groups were identified, and the nature, extent and outcomes of consultation to date – EIS Volume 1, Chapter 4;
- The nature and extent of company consultations conducted with the public and identified stakeholders – EIS Volume 1, Chapter 3; and
- Preliminary potential environmental and socio-economic interactions and effects of the Project – EIS Volumes 2 and 3, Chapters 9-22.

In addition, the EIS contains Concordance Tables (in the Executive Volume), which describe the location of EIS information relevant to various aspects of the Scoping Document (Table C-1), *Canadian Environmental Assessment Act, 2012* (Table C-2), and the National Energy Board Electricity Filing Manual (Table C-3).

2 Nature of Project and its Components

2.1 General Description and Scope of the Project

The Project consists primarily of the construction of a 213 km single circuit 750 MW, 500 kV AC IPL extending from the existing Dorsey Converter Station northwest of Winnipeg, to a point on the Manitoba-Minnesota border just south of Piney, Manitoba (the “Dorsey IPL”). In order to accommodate Manitoba Hydro’s proposed route for the Dorsey IPL, Manitoba Hydro plans to move a portion of its existing Riel IPL slightly north within its transmission line corridor, so as to avoid the construction of two 500 kV transmission line crossovers. The alterations to the Riel IPL will involve the removal of three towers and a segment of the IPL, the construction of two new towers and the relocation of a segment of the IPL. In effect, a portion of the Riel IPL will be converted into a segment of the new Dorsey IPL. The Glenboro IPL will also require alterations in order to mitigate pre-contingency overloads on the Riel IPL resulting from increased power flows over the Manitoba-U.S. interface once the Dorsey IPL is in service. Two phase shifting transformers will be added to the terminal facilities of the Glenboro IPL at Glenboro Station. In order to accommodate the phase shifting transformers, Glenboro Station must be expanded and a segment of the IPL must be relocated. The Project will also include the addition of equipment to the

Dorsey Converter Station and Riel Converter Station, and some modifications to intra-provincial transmission lines. Maps describing the Project can be found in Appendix B. Map 1 shows the locations of the various Project components.

Manitoba Hydro does not consider the upstream facility, Keeyask Generating Station ("Keeyask"), as falling within the scope of the Project, although the purposes of the Project include the delivery of contracted energy under new export sales agreements made possible in part with the addition of Keeyask. Section 2 of *CEAA, 2012* defines a "designated project" as including one or more physical activities that are designated by the regulations made under paragraph 84(a) (such as the construction of certain IPLs), as well as any physical activity that is "incidental" to those physical activities. For a number of reasons, Keeyask is not considered incidental to the Project.

Firstly, the Project is not dependent on Keeyask in particular. As demonstrated in the NFAT proceeding referenced in Section 1.5 of this Project Description, the Project is justified based on a variety of factors, including the increased opportunity for imports to Manitoba, either to support reliability in times of drought or other emergencies, or when economically beneficial. These factors are unrelated to the construction of Keeyask. Furthermore, even though the Project will also be used for exporting surplus energy, this surplus is sourced from Manitoba Hydro's integrated, predominantly hydraulic, system, which includes numerous other generating facilities and cannot be linked specifically to generation sourced from Keeyask.

Secondly, the construction of Keeyask is not dependent on the Project. The Provincial NFAT proceeding justified the construction of Keeyask based on a number of factors including domestic resource needs and recommended proceeding with the construction of Keeyask without imposing any conditions related to the construction of MMTP. Similarly, the Order in Council authorizing the construction of Keeyask is not conditional on construction of the Project (Manitoba Order in Council 0029/2014).

It should also be noted that the assessment of the environmental effects related to the construction/operation of generating stations in Manitoba falls under provincial jurisdiction and is regulated under the provisions of *The Environment Act*. The environmental assessment for the Keeyask Generation Project has already been conducted and an Environment Act Licence was issued on July 2, 2014. Construction of Keeyask began in July of last year, well in advance of any approvals for this Project.

Manitoba Hydro's rationale for excluding upsteam facilities such as Keeyask from the scope of the Project and therefore the scope of the assessment is consistent with previous decisions of the National Energy Board, such as Hearing Order OH-001-2014 regarding the TransMountain Expansion Project, and OH-1-2007 issued with respect to the TransCanada Keystone Pipeline.

With respect to downstream facilities, Manitoba Hydro does not consider the Great Northern Transmission Line ("GNTL") as falling within the scope of the Project and its associated environmental assessment. Although the Dorsey IPL will be interconnected with the GNTL, this downstream facility is a separate project that is being developed by separate proponents. Accordingly, the U.S. transmission line is not under the sole control of the proponent of the Project - Manitoba Hydro. The GNTL is subject to environmental assessment procedures under U.S. law at both the federal and state levels. Furthermore, the exclusion of downstream facilities is consistent with the general approach taken by the National

Energy Board as stated in previous decisions such as OH-001-2014 in the TransMountain Pipeline matter.

2.2 IPL Routing Methodology

The final preferred route for the Dorsey IPL that is being proposed was determined using an approach based on the EPRI-GTC Routing Methodology (EPRI-GTC, 2006). The methodology is a quantitative, computer-based methodology developed by the Electric Power Research Institute (EPRI) and Georgia Transmission Corporation (GTC) for use as a tool in evaluating the suitability of an area for locating new overhead transmission lines. Based on analysis, macro corridors are created which define the route planning area. Using more detailed information, alternate corridors are then developed. Within the alternate corridors, alternate routes are identified and analyzed. Employing increasingly detailed data focused on areas of greater suitability, the methodology allowed Manitoba Hydro to take into consideration large amounts of information and to quantitatively consider input from Manitoba Hydro's engagement processes during Project development. The routing process began with more than 700,000 alternatives for comparison. This was reduced to 550,000 in the second round, and in the last round of final preferred route determination, nearly 4,000 alternatives were compared.

Feedback received through the Project engagement and environmental assessment processes was incorporated into routing decisions. Environmental and socio-economic routing criteria were considered in the route selection process. Routing criteria included proximity to residential concentrations, major developments, conservation lands, resource uses, riparian areas, and existing rights of way. Routing also considered sensitive sites - locations, features, areas, activities or facilities identified by discipline specialists, through the First Nations and Métis and Public Engagement Processes to be ecologically, socially, economically or culturally important or sensitive to disturbance in relation to Project infrastructure. Sensitive sites included valued and protected vegetation, wildlife and habitats, cultural sites (e.g., heritage/archaeological and spiritual sites), unique terrain features, erosion- and compaction-prone soils, and other important locations where route avoidance would be an effective means of mitigation.

2.3 Project Location

2.3.1 Overview

Map 1 (Appendix B) displays the various Project components and their location in Manitoba. Further details regarding the location of the Project components are provided below.

2.3.2 Dorsey IPL and Modifications to Riel IPL

2.3.2.1 Use of Existing Corridors

Manitoba Hydro has been planning, acquiring and obtaining easements for dedicated transmission corridors that contain multiple transmission lines since the early 1960s. The purpose has been to minimize the effects of multiple independent right-of-ways ("ROWs") in an area subject to extensive development surrounding the City of Winnipeg. The result is the establishment of a corridor that could house multiple transmission lines connecting stations around Winnipeg for the purposes of enhanced reliability and movement of power into and out of the Winnipeg centered grid. The Dorsey IPL will utilize two existing corridors: the Southern Loop Transmission Corridor, which traverses from Dorsey Converter

Station to southeast Winnipeg, and the Riel – Vivian Transmission Corridor which traverses from Riel Converter Station eastward (see Map 2, Appendix B).

During the transmission line routing process the utilization of existing corridors was encouraged by stakeholders and the public and factored heavily in the transmission line routing process. As a result, the existing Southern Loop and Riel-Vivian Transmission Corridors were used to route a substantial portion of the Dorsey IPL as a mitigative decision. The decision was made early in the routing process to avoid acquiring a new ROW within prime agricultural land and rural residential development areas in locations where an existing planned transmission corridor had sufficient space to house the transmission line. As proposed, close to half of the route (92 km) is located in existing transmission line corridors. In addition, the majority of land (157 km, or almost 74%) that would be crossed by the
Dorsey IPL for the entire proposed route is privately owned, with a large portion of this (74 km) consisting of land either already under easement or owned by Manitoba Hydro.

Southern Loop Transmission Corridor

The Southern Loop Transmission Corridor (SLTC) is a utility corridor that extends from Dorsey Converter Station south and then east, circumventing the City of Winnipeg and ending at the Riel Converter Station located on the east side of the City adjacent to the Red River Floodway (Map 2, Appendix B). The existing SLTC is up to 245 m wide and is designed to accommodate multiple transmission lines necessary for system reliability and to meet future energy demands in southern Manitoba. Approximately 68 km of the Dorsey IPL will be constructed within the SLTC between the Dorsey and Riel Converter Stations. At the Riel Converter Station, the IPL will exit the SLTC and enter the Riel-Vivian Transmission Corridor.

Dorsey Converter Station to La Verendrye Segment

Starting from the Dorsey Converter Station, at geographic coordinates of approximate latitude of 49.9882 degrees and longitude of -97.4318 degrees, the Dorsey IPL will head south along the SLTC as shown in Map 2. As described below, the IPL will need to cross a variety of infrastructure in the SLTC due to physical constraints. In the instance of existing intraprovincial transmission lines, it will cross two 230 kV double circuit transmission lines associated with the Dorsey Converter Station (D11Y & D15Y and D14S & D55Y) as well as one 230 kV single circuit and two 115 kV double-circuit transmission lines associated with the La Verendrye Station (Y51L, YM31, Y51L, YT10), as shown in Figure 1. The IPL will also need to cross one double circuit 115kV transmission (VT63, VJ50) and one proposed single circuit 230 kV transmission line (V95L).

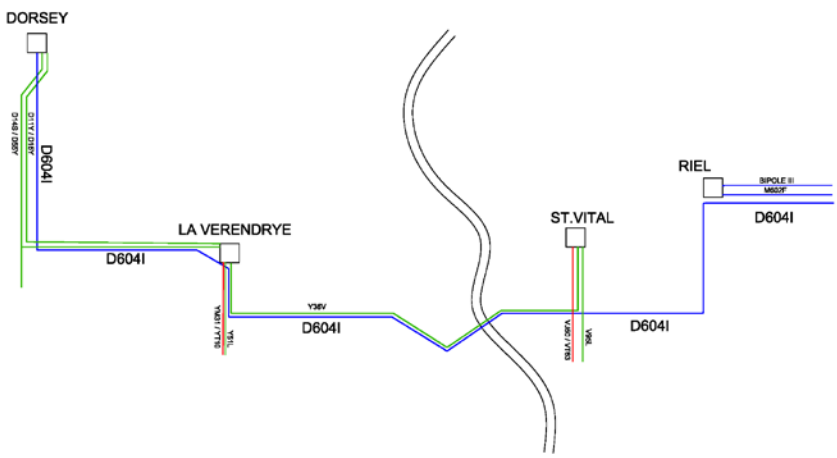

Figure 1 – Southern Loop Transmission Corridor – Transmission Line Crossovers

The IPL will exit the west side of Dorsey Converter Station switchyard, then head south along the SLTC. Just south of Dorsey Station it will cross Provincial Road ("PR") 221, then two double-circuit intraprovincial transmission lines (D11Y & D15Y, as well as D14S & D55Y) also exiting Dorsey Converter Station. The IPL will continue south through agricultural land, passing along the west side of an intensive hog operation, along the SLTC for approximately 12 km until it crosses the TransCanada Highway (TCH), just west of the town of Headingley. South of the TCH, the proposed route crosses the Assiniboine River. South of the Assiniboine River the proposed route continues south along the SLTC through agricultural land for approximately 6.5 km, crossing over PR 241, PR 427 and the Canadian Pacific Railway. The proposed route then crosses over two double circuit transmission lines (D11Y & D15Y and D14S & D55Y) then turns east paralleling these lines. It then continues east through agricultural land, crossing PR 334 heading to LaVerendrye Station.

La Verendrye to Deacon's Reservoir Segment

At LaVerendrye Station, the transmission line will turn south, crossing three intraprovincial transmission lines (YM31, Y51L, & YT10) connected to LaVerendrye Station. From LaVerendrye Station the proposed route heads south along the SLTC through agricultural land and crosses PTH 2, then heads east crossing YF11 and Provincial Trunk Highway ("PTH") 3. It continues east through agricultural land crossing PR 330 and PTH 75, heads northeast, crosses through Duff Roblin Provincial Park then over the Red River just north of the Red River Floodway inlet. East of the Red River, the proposed route crosses over the floodway, then over PR 200 and parallels the floodway on the south side for approximately 14 km, crossing over PR 300 twice, then the Seine River just south of where it enters the floodway. The proposed route then crosses PTH 59, one double-circuit 115kV transmission line (VT63, VJ50) and one proposed single-circuit 230kV transmission line (V95L). It continues to parallel the floodway as it turns north crossing the TransCanada Highway. The proposed route travels north for approximately 3 km,

passing along the west side of Deacon Reservoir and the City of Winnipeg's Water Treatment Plant south of the Riel Converter Station, as shown on Map 2 (Appendix B).

Riel–Vivian Transmission Corridor

After the proposed route leaves the SLTC it heads east within the Riel–Vivian Transmission Corridor (RVTC) along the northern end of Deacon's Reservoir along the south side of Riel Converter Station. The RVTC is a utility corridor that extends from the Riel Converter Station east to just south of Vivian, Manitoba (Map 2, Appendix B). The existing RVTC is 177 m wide. Within this corridor there is currently one 500 kV AC international power line (M602F - Riel IPL) and one 500 kV high voltage direct current (HVDC) intraprovincial transmission line (Bipole III), which is under construction. With the addition of the Dorsey IPL, there will be three lines in this corridor. When two 500 kV transmission lines are in close proximity to each other there is increased risk to reliability due to potential extreme weather events or equipment failures impacting both transmission lines. The risk to reliability is exacerbated when these lines cross over each other. The overhead crossing location of the Dorsey IPL and Riel IPL within the RVTC creates the potential for multiple lines to be out of service if the upper line were to fail and fall on the lower line. In order to mitigate this risk and avoid the construction of two 500 kV crossover structures, the existing Riel IPL and future 500kV transmission lines (D604I and Bipole III) have to be arranged to avoid or minimize the effects of crossing each other. To facilitate this, a segment of the existing Riel IPL from Riel to PTH 12 (approximately 24 km) will be utilized as a portion of the new Dorsey IPL. A portion of the Riel IPL will be moved from its current location and be built on new structures over the same 24 km distance just north of its current location within the transmission corridor. At the point where the Dorsey IPL exits the RVTC to the south on a new right of way, the Riel IPL will route back and connect to its existing structures, as shown in Figures 2 and 3.

Figure 2 Western Modifications to Riel IPL using a portion of new tower construction for its line.

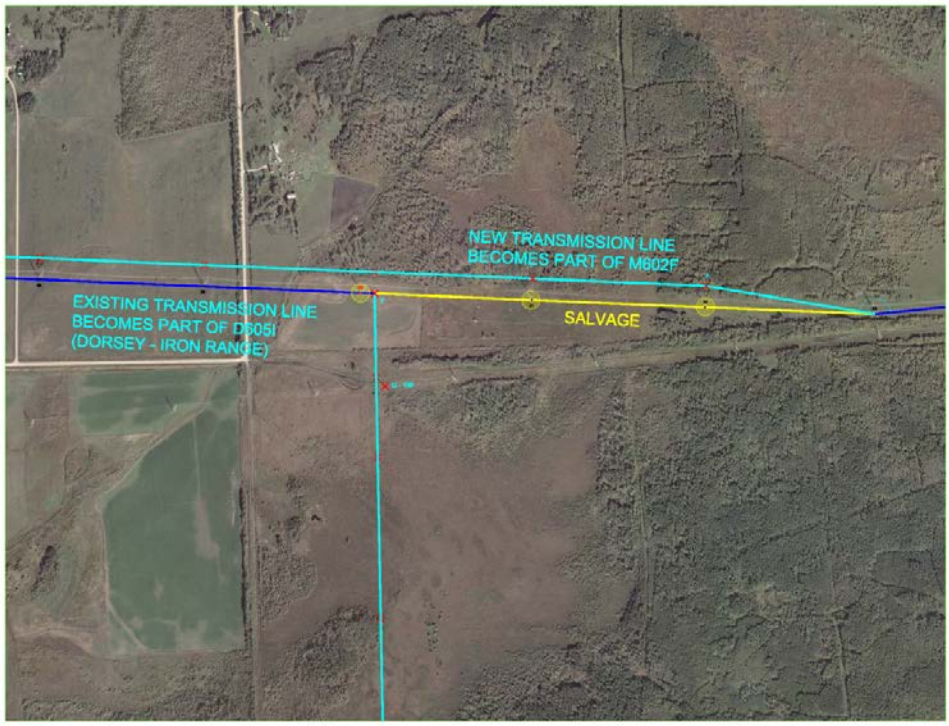

Figure 3 Eastern Modifications to Riel IPL using a portion of new tower construction for its line.

2.3.2.2 Use of New Corridors

From the existing Transmission Corridor, as described above, south of Anola, Manitoba, the Dorsey IPL will proceed south-east within a new ROW for approximately 121 km as shown on Map 3 (Appendix B). The new ROW, as designed, passes through a portion of southeast Manitoba that has a variety of land uses including agriculture, rural residential, and provincial Crown land. The ROW width requirement will be approximately 80 m for self-supporting towers and 100 m for guyed towers.

South of Anola, Manitoba and east of PTH 12 the proposed route turns south, entering a new ROW through agricultural land. The proposed route crosses the Greater Winnipeg Water District (GWWD) aqueduct and the GWWD Rail Line. At this point, the landscape starts to change from primarily agricultural land to a mix of pasture land and forested area. Land ownership becomes a mix of provincial Crown and private land. The proposed route parallels the existing 230kV Transmission line (R49R) from Ridgeway Station to Richer South for just over 4 km. The proposed route continues southeast then turns south crossing over R49R then paralleling it on the west side, in a southeasterly direction for approximately 8 km. The proposed route runs east of Cottonwood and Oakwood Golf Courses and crosses the TransCanada Highway for the third time.

The proposed route separates from R49R at Richer South Station and turns southwest. It runs through several parcels of proposed protected area at Richer South Station. From that point the proposed route crosses PR 302 and then heads generally south for approximately 37 km. It then runs along the eastern edge of La Verendrye Golf Course then crosses PR 210 and the Canadian National Railway. It then turns southeast running adjacent to the western boundary of the Watson P. Davidson Wildlife Management Area ("WMA"). At the south end of the WMA, the proposed route runs southeast passing through the

Caliento Bog. The proposed route stays west of the Spur Woods WMA then runs east-southeast through mixed pasture and natural areas, then turns southeast running west of Piney Creek. It then crosses over Piney Creek and meets the international border just east of Piney Creek at geographic coordinates of approximately 49.0000 degrees latitude and -95.9140 degrees longitude.

2.3.3 Modifications to Stations and Glenboro IPL

2.3.3.1 Dorsey Converter Station

Modifications and additions will be undertaken at the existing Dorsey Converter Station northwest of Winnipeg in Rosser, Manitoba to connect the Dorsey IPL to the existing electrical network. In order to accommodate the new equipment and line termination the station site will also need to be modified. The station fence line will be expanded to the west for a total of 15,902 m^2 on Manitoba Hydro-owned property. Map 4 (Appendix B) outlines the planned station expansion.

2.3.3.2 Riel Converter Station

Modifications will be undertaken at the Riel Converter Station located east of the Red River Floodway and north of the City of Winnipeg's Deacon Water Supply Reservoir in the Rural Municipality of Springfield (Map 5, Appendix B). All additions will be contained within the current fenced area of the 500 kV switchyard portion of the Riel Converter Station.

2.3.3.3 Glenboro IPL and Glenboro South Station

Manitoba Hydro's Glenboro South Station is located 1.5 km south of the junction of Provincial Trunk Highway (PTH) 2 and PTH 5 in an agricultural dominated landscape (GPS coordinates 49°32'18"N, 99°17'02" W). This station contains the termination facilities of the Glenboro IPL that transmits power from Glenboro South Station to interconnected U.S. facilities at the international boundary. To accommodate the addition of two new phase shifting transformers ("PSTs"), the site will need to be modified. The Glenboro South Station fence line will be expanded 130 m x 91 m east of the existing 230 kV switchyard on Manitoba Hydro owned property. In addition to the above, modifications to two intraprovincial lines (S53G, G37C) and the Glenboro IPL (G82P) will be required. Map 6 (Appendix B) displays the proposed expansion and relocation.

In order to expand the Glenboro South Station to accommodate the PSTs, a segment of the Glenboro IPL must be relocated. A portion of the IPL from Glenboro South Station to Tower 3 spanning approximately 345 metres will be salvaged, as well as Towers 1 and 2. From Tower 3, a new segment of the IPL (500 metres) and two new steel lattice towers will be built to connect to the station.

2.4 Project Schedule and Workforce

2.4.1 General

Figure 4 displays the current Project schedule, developed subject to regulatory approvals. In total, clearing and construction of the Project will require approximately 33 months to complete. This is organized into three general phases of work: construction within the existing SLTC, construction from Riel to the international border, and realignment at the Glenboro South Station.

Figure 4 Current Transmission Line Construction Schedule

2.4.2 Transmission Line

Subject to regulatory approvals, transmission line construction for the SLTC is being scheduled to start in the summer of 2017 and to be completed by the spring of 2018. Construction during this period will peak during the fall of 2017 and winter of early 2018 where the average number of contractor workers on-site would be approximately 70. The other months during this time period would have approximately 50 contractor workers on-site. During the construction period for the south loop in addition to contractor workers, Manitoba Hydro employees will peak at approximately 10 staff.

Constructing the transmission line from Riel to the international border will commence in spring of 2018 and be completed by winter of 2020. During this time the work force will peak in winter of 2019 when the number of contractor workers on-site will be approximately 80. During the winter of 2019, numbers of Manitoba Hydro employees will peak at approximately 15 staff.

Transmission line re-alignment at Glenboro South Station will occur between spring and summer of 2019. During this time, contractor workers will peak at 15. Most of the transmission line relocation work will be undertaken by Manitoba Hydro employees. During this time, the workforce will peak at 15.

Work force requirements associated with the operations and maintenance of a particular transmission line generally involve deployment of established regional operations and maintenance personnel, and contractor staff as required. Line inspections could involve concurrent inspections of various lines in the region. Maintenance would include repairs as required. The workforce for maintenance activities could be between three and five workers. During emergency situations, the size of the workforce is largely dictated by the work required.

2.4.3 Stations

2.4.3.1 Riel Converter Station

Subject to regulatory approvals, work at Riel Converter Station will commence in the summer of 2017 and will be completed in the fall of 2019. Contractor workers will peak during this time between the fall of 2017 and the summer of 2018 with approximately 55 workers on site. Manitoba Hydro employees will be on site for the duration of construction and will peak with approximately 11 workers.

2.4.3.2 Dorsey Converter Station

Subject to regulatory approvals, work at Dorsey Converter Station will commence in the spring of 2018 and will be completed by the fall of 2019. There are only two months at the start of construction that will

have contractors on site. During the remaining time exclusively Manitoba Hydro employees will be on site and the number of staff will peak at 27 employees in total.

2.4.3.3 Glenboro South Station

Subject to regulatory approvals work at Glenboro South Station will commence in the spring of 2019 and will be completed by the summer of 2019. Contractor workers will peak during this time at approximately 15 for a three-month period, with approximately the same number of Manitoba Hydro employees on site as well. There will be two months at the end of construction that will only have Manitoba Hydro employees on site.

2.5 Engineering Design and Project Activities

2.5.1 Transmission Line Design

2.5.1.1 Dorsey IPL

The proposed IPL will be a single circuit, 500 kV AC transmission line that will be 60% series compensated at the midpoint. The transmission towers will support one set of triple Aluminum Core Steel Reinforced conductor bundles for each of the three phases suspended from insulators. The IPL will be constructed of self-supporting lattice steel towers on agricultural and rural residential land to mitigate adverse effects by reducing tower footprints and ROW width. Guyed lattice steel towers will be used on non-agricultural lands to mitigate effects on tower stability caused by saturated soils and to reduce material and construction costs. Four types of towers will be used: tangent towers, anti-cascading towers, angle towers and dead-end towers. Interconnected porcelain or glass disc insulators will be placed between the conductor bundles and the towers to prevent arcing and grounding. Towers will be placed approximately 400 metres apart, depending on site conditions. The IPL structure height is expected to range from 50-60 metres, depending on terrain conditions and environmental sensitivity. Two skywires will be strung along the tops of the towers to provide lightning protection. One of the skywires will be equipped as an Optical Ground Wire ("OPGW"). The OPGW is designed to provide system protection and communication for the IPL. An underground fibre optic cable (400 metres long) will be installed from the corner tower of the IPL to the Richer South Station control building to provide connection to the Station's repeater equipment. The tower foundation design will vary with soil and terrain conditions (mat or pile) as detailed in Section 2.5.2.5.

2.5.1.2 Riel IPL Relocation

A portion of the Riel IPL will be relocated slightly north within the existing transmission line corridor to allow the preferred routing of the Dorsey IPL as proposed without the construction of two 500 kV crossover structures that would otherwise be required to enable the Dorsey IPL to cross over the Riel IPL. Figures 5 and 6 depict the details of the relocation. Tower 6 of the Riel IPL will be removed and the existing segment of the IPL from Towers 5 through 7 (442.5 km long) will be relocated to two new towers shown as "B" and "C" on Figure 5. The Riel IPL will then continue eastward along a new section of line from Tower C (as shown in yellow on Figure 5) for 22.8 km to existing Tower 63 as shown on Figure 6. The former portion of the Riel IPL between Tower 7 and Tower 60 will become part of the Dorsey IPL with the replacement of Tower 60. Existing Towers 61 and 62 of the Riel IPL and approximately 1.07 km of transmission line will be removed and salvaged.

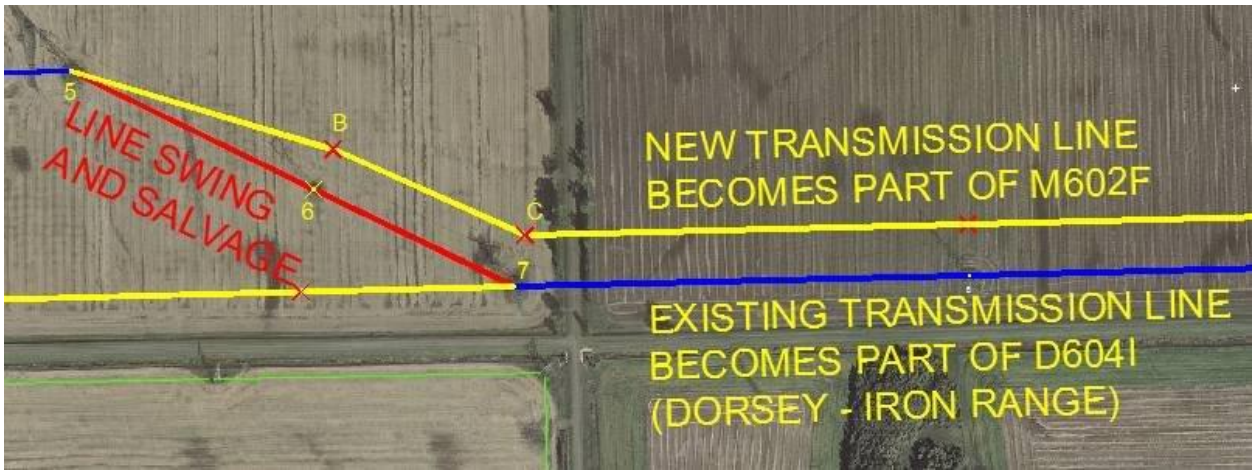

Figure 5 Riel IPL Relocation Detail

Figure 6 Riel IPL Relocation Detail

2.5.1.3 Glenboro IPL Modifications

Modifications to the Glenboro IPL will consist of the addition of two series connected 300 MVA 230 kV +/- 40 degrees phase shifting transformers to the terminal facilities at Glenboro Station. This modification is required in order to mitigate pre-contingency overloads on the Riel IPL resulting from increased power flows over the Manitoba-U.S. interface once the Dorsey IPL is in service. In order to accommodate the phase shifting transformers, the Glenboro Station must be expanded and a segment of the IPL must be relocated. A portion of the IPL from Glenboro Station to Tower 3 spanning approximately 345 metres will be salvaged, as well as Tower 1 and Tower 2. From Tower 3, a new segment of the IPL (approximately 230 metres) and one new permanent tubular steel tower will be built to connect to Glenboro Station. Two temporary tubular steel towers will also be required.

2.5.2 Transmission Line Construction Process

2.5.2.1 General

The following sections describe the various activities associated with the construction phase of the Dorsey IPL, including the following: access, mobilization, ROW clearing, transmission line construction, marshalling yards, borrow sources, accommodations and construction camps, clean-up and demobilization.

2.5.2.2 Access

Access for construction and subsequent line maintenance activities will generally occur along the ROW using existing public access roads or trails wherever possible. This minimizes the requirement for the development of new temporary trail access and the associated environmental effects. Minor deviations (bypass trails) from the ROW may be necessary in severe terrain conditions. Unless required for ongoing maintenance, the ROW access trails will not be regularly maintained post construction.

Construction activity and access for the purposes of construction will be subject to standard environmental protection measures associated with Manitoba Hydro's transmission line construction practices. These will be identified and cross-referenced in site-specific Environmental Protection Plans, and adherence to them will be stipulated in related contract specifications.

At waterway crossings, structures will be located as far back from the water's edge as possible, to maximize stability and prevent bank erosion. Construction procedures used at each required crossing will be based on site-specific considerations, such as existing soil and subsurface conditions, biophysical sensitivities, and operational requirements. Site-specific construction techniques will be developed where necessary for difficult terrain or steep slope conditions. Contractors will be required to develop sediment and erosion control plans.

Equipment access and construction activities will be carried out in a manner that will minimize disturbance to shorelines. Vegetative buffer zones will be retained along the shorelines wherever possible. The precise character and extent of buffer zones will be determined on a site-specific basis. In general, existing and potential future tree heights will govern the amount of clearing that must be done in buffer zones to ensure the safe operation of the line.

Existing intersections, such as those for trails, PTHs, PRs and railways, are considered sensitive to change or conflicting land uses. Use of trails is important for recreational, commercial and subsistence hunters, gatherers and trappers. Ensuring there is safe access to these trails is important to minimize effects on resource users. In conjunction with general mitigation measures, a standalone document called the "Access Management Plan" (AMP) has been developed by Manitoba Hydro to safeguard and support the preservation of environmental, socio-economic, cultural and heritage values within the Project's area of direct impact in the creation of new access.

2.5.2.3 Mobilization

The first step in clearing and construction is the mobilization of a workforce to an area. Mobilization includes the movement of Manitoba Hydro and contract staff, vehicles and equipment to the job site. Generally, mobilization is ongoing throughout the construction phase as different types of equipment are required for specific activities such as clearing, tower construction and conductor stringing.

2.5.2.4 Right-of-Way Clearing and Geotechnical Investigations

Clearing and disposal of trees on the proposed ROW will be undertaken in advance of construction to facilitate construction activities. ROW clearing will be subject to standard environmental protection measures that have been established in association with Manitoba Hydro transmission line construction practices, as well as the Construction Environmental Protection Plan, filed as part of the EIS. With the exception of environmentally sensitive areas, the cleared ROW width for the structures will vary

depending on location and tower type. Clearing will be modified in environmentally sensitive areas (*e.g.,* river and stream crossings) and will be subject to a variety of pre-determined but adaptable environmental protection measures.

Clearing requirements for the new transmission line ROWs will also require selective clearing of "danger trees" beyond the ROW. Such trees could potentially affect the function of the transmission line or result in safety concerns, and are normally identified during initial ROW clearing activities and removed. A variety of methods are available for ROW clearing. Typically, these include conventional clearing done by "V" and KG" blades on tracked bulldozers, mulching by rotary drums, selective tree removal by feller bunchers (*e.g.,* for removal of danger trees with minimal adverse effect to adjacent vegetation and trees) and hand clearing with chain saws in environmentally sensitive sites. Final clearing methods will be determined on the basis of detailed surveys of the transmission line routes, and site-specific identification of environmentally sensitive features.

Trees within the ROW will be cleared to a maximum height of approximately 10 cm (4 inches) above the ground. Ground vegetation will not be "grubbed" except at tower sites, where the foundation area will typically be scraped to allow unencumbered access for equipment and safe walking areas for workers. Disposal of cleared vegetation typically involves a variety of options including piling and burning, mulching, collection and secondary use by local communities (e.g. firewood), or salvage and marketing of merchantable timber resources if feasible. The final decision for disposal of vegetation will be determined based on the method of clearing used and *The Environment Act* licence conditions applicable to the Project. Apart from removal of danger trees along the ROW edges, clearing procedures are normally confined to the ROW. Where access outside the ROW is necessary (*e.g.,* bypass trails) and has not been identified in advance, supplementary approvals, if required, will be obtained from the Manitoba Government (*e.g.,* work permits and timber permits relating to activity on provincial Crown lands) or from individual landowners.

Geotechnical investigations involve the excavation of test pits and in some instances, such as angle towers, soil drilling to create a soil profile that is used by civil designers in the development of specialty foundations. Investigations take place as the ROW is cleared to allow access. Test pits located at tower foundation sites are excavated by a tracked excavator. They are backfilled once tests are complete.

2.5.2.5 Tower Installation and Wire Stringing

Transmission line construction involves several stages - installing tower foundations and anchors, assembling and erecting structures, and stringing of the conductor and overhead ground wires. The different stages entail the use of various types of vehicles and heavy equipment, and involve a range of skills and trades.

At the time of filing this Project Description, both structure and conductor designs are subject to final detailed design. No substantial changes are anticipated that would alter the conclusions of the environmental assessment of the Project. Unless otherwise specified, the following descriptions are based on current design and on prior experience with similar projects and conditions. The dimensions provided for the various structure and foundation types are subject to revision in the course of final design and confirmation of field construction conditions.

For the guyed suspension lattice steel structures, design and construction of the tower foundations will depend on soil and terrain conditions. For surface or shallow bedrock conditions, the lattice structures will be founded on a steel column fixed directly to the rock by steel dowels drilled and grouted into the rock. Where rock is not encountered, the structures will be founded on mat footings, sized to provide adequate bearing support (typically in the order of 1.8 m [6 ft.] square) and buried to a depth of approximately 3 m (10 ft.). Depending on soil conditions, deep foundations (*i.e.,* piles) may also be used.

For shallow or surface bedrock conditions, guy anchors will be secured by drilled and grouted anchors. Where bedrock is not encountered, deadman anchors, or other deep anchors (*e.g.,* screw anchors, overburden) will be used.

Self-supporting suspension lattice steel structures will be supported by either mat or pile foundations. Mat foundations will typically be 3 m^2 (9.8 ft.) by 3 m^2 (9.8 ft.) deep. Pile foundations will involve individual piles or pile groups, one for each leg of the structure. Piles will be cast-in-place concrete, generally 900 mm (36 in.) in diameter and approximately 10 m (33 ft.) in length, or steel pile groups with a welded cap (similar in footprint to concrete piles).

Guyed triple-shaft dead-end structures will be founded similarly to guyed suspension structures but will require a separate foundation for each of the three vertical members. In the case of mat footings, their dimension will be in the order of 1.8 x 3.6 m (6 x 12 ft.).

Self-supporting angle and dead-end structures will be supported by either mat or pile foundations. Mat foundations will typically be 4 m^2 (13.1 ft.) by 3 m^2 (9.8 ft.) deep, for each leg of the structure. Pile foundations will typically consist of four 1200 mm (48 in.) diameter concrete piles approximately 11 m (36 ft.) in depth, or steel pile groups with a welded cap (of similar footprint to concrete piles). Dimensions will be subject to detailed design and will vary for specific foundation conditions.

Where necessary (*e.g.,* in the case of organic soils), foundation excavations will be backfilled with soil or granular material. Where wet or unstable soil conditions are encountered, the mat foundations may be installed inside a large diameter steel culvert section to provide additional stability. These requirements may be limited to guyed tangent or suspension structures.

Different contractors will have different preferences with respect to structure assembly. Some will choose to assemble structures at each tower site and then erect them by crane. Others will choose to assemble the structures at a central marshalling yard and then either truck the structures to the site and erect them by crane, or use a helicopter to fly the towers to the site and erect them.

Insulator strings will be attached to the structure cross arms prior to tower erection. The insulators will separate the conductors from the structures. Conductor will be transported to the site in reels, then suspended from the insulator strings, and tensioned by machine to provide the ground-to-conductor design clearances specified at the mid-span points of maximum sag. Each reel holds about 3,200 m (10,500 ft.) of conductor. To create a continuous conductor the ends of conductor reels will be spliced together by use of implosive sleeves.

2.5.2.6 Marshalling Yards

Marshalling yards will typically be established near the transmission line route for the storage of construction materials and equipment and for further deployment to the construction site. The exact

number and location of marshalling yards will be determined during the course of developing detailed construction specifications and contract arrangements.

2.5.2.7 Borrow Sources

Aggregates required for use in foundation construction will generally be transported from established and appropriately licensed sources off-site. Suitable material for the backfill of excavated organic soil may be hauled from newly-developed borrows areas along the ROW. Potential borrow locations have not been specifically identified at this time. Typically, borrow pit locations will be located along the ROW to minimize environmental disruption, haul distances and cost. Where suitable sources are not available along or close to the ROW, nearby deposits may have to be identified and the surrounding brush cleared to gain access to the line. Normally, rubber-tired dump trucks are used to transport gravel and fill materials. Selection, development and reclamation of new borrow sites will be undertaken in accordance with provincial regulations and with the approval of the local Natural Resources Officer and local government authorities. Where borrow pits are required, exposed soils will be reclaimed by promoting re-growth of native vegetation and other mitigation measures in accordance with *The Mines and Minerals Act.*

Any use of explosives during transmission line construction (i.e., foundation installation and conductor splicing) will be conducted in accordance with all applicable federal and provincial legislation and regulations, including compliance with all conditions set by Manitoba Conservation (see Appendix A).

2.5.2.8 Accommodations and Construction Camps

Clearing and construction workers will be housed in suitable accommodations available in local communities where feasible and in mobile construction camps if required. Mobile construction camps would include sleeper units, a wash car, cooking and eating trailers, offices and a machine/parts shop. These camps will generally be relocated along the ROW as various construction activities proceed. Camp size could be in the range of 10 to as many as 100 workers, but will vary according to the activity, contract size and labour force requirements.

Mobile construction camps are generally located in well-drained areas within the ROW or in pre-disturbed locations with access to electrical supply. Additional clearing may be required, however, to facilitate vehicular traffic, transportation and distribution of construction materials, and installation of temporary maintenance shops, kitchens, sleeping quarters, offices. Specific field camp locations will be determined after final Project planning and design is completed. As construction moves down the line, the camps will be relocated at intervals of approximately 60 to 80 km (about 35 to 50 mi.) to limit travel time for workers. Potable water will generally be transported to the camps and stored in cisterns. Wastewater will typically be stored in licensed holding tanks that will be pumped and disposed of at licensed waste-disposal grounds to limit the potential for surface or groundwater contamination. All mobile construction campsites will be restored to pre-Project condition with the exception of vegetation, which will be allowed to regenerate naturally on the sites.

2.5.2.9 Demobilization

The final step in the construction phase is the demobilization of a workforce from an area. Demobilization includes the movement of Manitoba Hydro and contract staff, vehicles and equipment from the job site, as well as the clean-up (and if required rehabilitation) of camps, marshalling yards, borrow sources and

access routes. Generally, demobilization is ongoing throughout the construction phase as different types of equipment are required for specific activities such as clearing, tower construction and conductor stringing. As soon as possible after completion of construction, the sites will be cleaned up and left in standard operating condition. All non-toxic materials will be disposed of using existing, appropriately licensed local facilities. Material supply and waste handling will be subject to conventional Manitoba Hydro codes of practice and relevant provincial and federal legislation. All cleanup and rehabilitation activity will be subject to the requirements of the Environmental Protection Plan, filed as part of the EIS.

2.5.3 Transmission Line Operation and Maintenance

2.5.3.1 Inspection and Maintenance

Manitoba Hydro conducts inspection of all of its 200kV and above transmission lines and ROW corridors on an annual basis in addition to emergency situations. The inspections include, but are not limited to, vegetation management, repairing foundations and insulators, and removing ice build-up. Crews triage infrastructure during emergency situations to address line outages and tower damage. Following the inspection, all pertinent information and findings are entered into a transmission line management database program. From this central database, annual maintenance activities are identified and tracked.

The annual patrol is conducted either by ground or by air depending on access, geographic conditions and time of year. Non-scheduled patrols, by ground or air, may be conducted if the Manitoba Hydro System Control Center identifies a fault on the line that requires visual inspection. Patrols are normally undertaken by snow machine, all-terrain vehicles, light trucks or helicopter, depending on the geographical location and ease of access.

Maintenance procedures are well established and are the subject of continuously updated corporate guidelines for maintenance and construction activities. Maintenance activities include instances where crews are required to obtain access to specific areas to repair deficiencies on the transmission system. Maintenance repairs are typically done in the winter months, after frost has entered the ground, using heavier soft track equipment to gain access. When summer access is required in agricultural areas, related maintenance activities are planned, wherever possible, to avoid conflict with farm activity.

In circumstances where maintenance activity requires the use of access trails off the ROW (*e.g.,* difficult terrain), approval is first obtained from Manitoba Conservation when on provincial Crown land. In areas where access to or across private lands is required, or if working within private lands under easement, the landowners are contacted in advance.

2.5.3.2 Vegetation Management

Vegetation management is required on an ongoing basis to ensure that re-growth in the cleared ROWs does not interfere with transmission line operations. Related management procedures extend to periodic review and removal of danger trees in the immediate vicinity of the ROW. Manitoba Hydro is also subject to North American Electric Reliability Corporation (NERC) reliability standard requirements that have been adopted in Manitoba under Manitoba Regulation 25/2012. Currently effective standard FAC 003-1 stipulates that vegetation control be conducted along ROWs to prevent situations from arising where trees can cause an outage on transmission lines 200 kV or greater.

Integrated vegetation management involves a variety of methods, including hand cutting (*e.g.,* utilizing chainsaws, brush saws, axes, or brush hooks) and mechanical shear blading using "V" or "KG" blades. KG blades are bulldozer blades with a sharpened lower edge or are angled V-shaped for splitting large trees and stumps. With care, trees can be sheared at ground level and felled or piled (windrowed) with little soil disturbance. Brush mowing with rotary and drum cutters (typically rubber-tired equipment), and herbicide treatments are also utilized. The methods above are typically conducted on foot, or by all terrain or flex-tracked vehicles. Due to access constraints in some areas, brushing may be completed during the winter months using the shear blading method. In agricultural areas, vegetation management schedules are adjusted to accommodate farming schedules. The vegetation maintenance brushing cycle for transmission line ROWs typically ranges between 8 and 10 years.

This type of integrated vegetation management approach is used in order to maintain a safe, reliable and uninterrupted transmission of electric energy. The focus of vegetation management is on the tall-growing tree species that have the potential to grow or fall into, or within, the arcing distance of the transmission lines and or facilities and cause an outage. The management practices that may be used to control vegetation incorporate mechanical, chemical, biological and/or cultural options depending upon a number of factors including site conditions and the sensitivity of surrounding areas.

Herbicide treatments are formulated to target undesirable tall growing trees but are also effective on broadleaf weeds, leaving grasses unaffected. Foliar applications of herbicides are applied during the warmer months while dormant stem applications are typically applied in the fall and winter. Permits for pesticide use are obtained as required. The process involves public notification as part of the formal permit application to MCWS's Pesticide Approvals Branch.

All herbicide applications are completed and supervised by licensed applicators and in accordance with conditions specified in the Pesticide Use Permit. Herbicide application rates at Manitoba Hydro are established by the Chief Forester in accordance with product label instructions. Only herbicides that have been listed in the Pesticide Use Permit are used by Manitoba Hydro. For the purpose of facilitating compliance with legal requirements, Manitoba Hydro has developed a pesticide applicator requirements document for its employees that provides regulatory and applicator licensing information; technical guidance; safety requirements and check lists for line managers responsible for pesticide application. In addition, this document provides information to ensure consistent pesticide management at all Manitoba Hydro facilities, thereby ensuring that pesticide management is carried out in such a way that resulting environmental impact is minimal.

Several methods of herbicide application are available. High volume broadcast stem/foliar application equipment, used for tree heights of 2.5 m (8 ft.) or less, includes droplet applicators (such as Radiarc and Vecta-Spray sprayers), boom busters, and hose and handgun sprayers. Aerial foliar spraying has also been used as an application technique and could be used in the future. Selective stem/foliar applications (both high and low volume) are the preferred method for tree heights of 2.5 m (8 ft.) or less, and are made with hose and handgun sprayers, or backpack sprayers.

Individual stem treatment includes thin line or similar basal treatment applications made with hand-held equipment to direct a low-pressure stream to the lower tree stem, or tree injection techniques. These can be completed at any time of year and on trees over 2.5 m (8 ft.) in height, and are used in circumstances where selective treatment is necessary for environmentally sensitive sites. Wherever practical, stump

treatment is used following hand-cutting to provide selective control of suckering for deciduous species and to minimize effects on desirable vegetation.

In addition to tree control, weed control on the ROWs may be required under the *The Noxious Weeds Act (C.C.S.M. c. N 110)*. In agricultural areas, continued cultivation will reduce the need for weed control. Alternative techniques for the uncultivated portions of the ROW include mowing and herbicide spraying. Spraying equipment includes backpack sprayers, truck-mounted power sprayers equipped with a broadcast applicator system, hose and handgun, and all-terrain vehicle (ATV) mounted power sprayers.

Prior to any vegetation management work on private land under easement agreement with Manitoba Hydro, the land owner will be notified and permission requested for access across the land to get to the ROW. On provincial Crown lands, a work permit issued under *The Forest Act* (F150) is required and owners adjacent to the ROW. Manitoba Hydro's Chief Forester is responsible for obtaining the necessary Pesticide Use Permits and submitting Post Seasonal Control Reports as per Manitoba Regulation 94-88R under *The Environment Act*.

2.5.3.3 Biosecurity

Manitoba Hydro's Agricultural Biosecurity Policy was created to prevent the introduction and spread of disease, pests and invasive plant species in agricultural land and livestock operations. Manitoba Hydro employees and contractors will follow this corporate policy and Manitoba Hydro's Transmission Business Unit Agricultural Biosecurity Standard Operating Procedures (SOP). In relation to this policy, agricultural land is defined as land zoned for agricultural use by the provincial government, planning commission or planning district.

Manitoba Hydro staff and contractors have the potential to address agricultural biosecurity through construction and/or maintenance activities requiring access to agricultural land. Acknowledging this risk, the purpose of the Agricultural Biosecurity corporate policy is to ensure that Manitoba Hydro staff and contractors take necessary precautions to protect the health and sustainability of the agricultural sector.

The SOP and the training associated with it apply to all the employees of Manitoba Hydro's Transmission Business Unit as well as external contractors or consultants who conduct work on behalf of the Transmission Business Unit and are required to enter agricultural land. The SOP include procedures to provide guidance and direction to staff and contractors/consultants who may be required to enter agricultural land and the levels of cleaning necessary to reduce the likelihood of soil and manure transport of invasive species, pests or disease.

2.5.4 Transmission Line Decommissioning

Should the Dorsey IPL be decommissioned at some future date, subject to any required regulatory approvals at the time of decommissioning, Manitoba Hydro will apply acceptable means for environmentally restoring Project sites and ROWs. Current methods of transmission line decommissioning entail the dismantling of the structures and salvage or disposal of all steel structure components, as well as removal and salvage of insulators, conductors and ground wires. Decommissioning of ROWs currently involves clean-up and/or remediation to a standard commensurate with local environmental conditions, including the applicable land use and policy in effect at the time of decommissioning.

2.5.5 Station Modifications and Additions

2.5.5.1 Engineering Design

Dorsey Converter Station

Manitoba Hydro's Dorsey Converter Station is the southern terminus for the utility's HVDC transmission lines. There are two main components to the converter station, the 500 kV Switchyard and the 230 kV Switchyard that are used to convert and distribute electricity in southern Manitoba.

Modifications in the switchyard will include 500kV bus extension and bay modifications (*i.e.,* structures), the addition of a 500 kV breaker, 500 kV single-phase current transformers, a 500 kV line termination, and 500 kV single phase shunt reactors. Components that will be relocated within the expansion of the new 500 kV yard will include all the necessary concrete foundations, steel structures and equipment supports. Equipment foundations will range from concrete slab-on-grade to deep piled foundations, depending on equipment weight and geotechnical conditions. Steel structures will be placed on the foundations and will support electrical apparatus and electrical conductors, and hardware associated with the switchyard. The switchyard will be air-insulated. A fence extension is required farther west of the site. The proposed expansion will require an area of approximately 15,900 m^2. There will be also modifications carried out in the 230 kV yard. All the existing bus support 230 kV post insulators will be replaced with extra high-strength 230 kV post insulators.

Riel Converter Station

The site has a dual purpose and is presently under development for the previously approved and licensed Riel Reliability Improvement Initiative and the construction of the Riel Converter Station required for the Bipole III complex.

Modifications related to MMTP in the 500 kV yard at Riel Converter Station will include the addition of a new 500 kV-230 kV autotransformer, 500 kV and 230 kV breakers, 500 kV and 230 kV single-phase, 400 MVA current transformers. Components within the 500 kV yard will include all the necessary concrete foundations, steel structures and equipment supports. Equipment foundations will range from concrete slab-on-grade to deep piled foundations, depending on equipment weight and geotechnical conditions. Steel structures will be placed on the foundations and will support electrical apparatus and electrical conductors, and hardware associated with the switchyard.

Glenboro South Station

Manitoba Hydro's Glenboro South Station 230 kV bus is connected to the system by three 230 kV lines – S53G from St. Leon, G37C from Brandon Cornwallis, and the Glenboro IPL (G82P) from Rugby, North Dakota.

As indicated in Section 2.5.1.3, two three-phase, 300 MVA, 230 kV, +/-40 degree phase shifters will be installed on the terminal facilities of the Glenboro IPL located at this station. The addition of the phase shifters will increase the footprint of the existing station. This requires the Glenboro South Station to be expanded 130 m x 91 m east of the existing 230 kV switchyard. Several towers on existing lines will have to be relocated to accommodate the station expansion and installation of new equipment. The phase-shifter is oil filled and will have an oil containment pit that will be integrated into the overall Glenboro South station oil containment system. In order to accommodate the installation of the two phase shifters

at Glenboro the following existing equipment will be included in the expanded fenced area: 230 kV breaker, 230 kV circuit switcher, 230 kV shunt reactor, 230 kV capacitive voltage transformers (CVT), wave traps and 230 kV arresters and the addition of two 230 kV breakers. New and relocated components within the 230 kV yard will include all the necessary concrete foundations, steel structures and equipment supports. Equipment foundations will range from concrete slab-on-grade to deep piled foundations, depending on equipment weight and geotechnical conditions. Steel structures will be placed on the foundations and will support electrical apparatus and electrical conductors, and hardware associated with the switchyard.

2.5.5.2 Site Preparation

Site preparation at the Dorsey, Riel and Glenboro stations will take into account both existing drainage patterns surrounding the site and the need to protect the existing station from overland flooding during spring runoff or an extreme rainfall event. Work on all stations may require additional localized drainage modifications. A newly developed drainage system for expansions will integrate the existing site grading and drainage design. All newly developed areas will be covered with an insulation stone course, approximately 150 mm in thickness, and typically consisting of 20-40 mm diameter clean stone aggregate. The Dorsey Converter Station site will be expanded to the west to accommodate the new transmission line termination. The site expansion will be 40 m x 273 m and 53 m x 94 m for a total of approximately 15,902 m^2 west on Manitoba Hydro owned property. Salvage of 175 linear meters of existing fencing and the installation of 420 linear meters of new fence will occur at the site and the relocation of two station vehicle gates. Expansion of the Glenboro South Station requires approximately 8,780 m^2 of site preparation will be required with the addition of 335 linear meters of fence and salvaging of 70 m of existing fence. A new access gate into the expansion is also required.

2.5.5.3 Oil Storage and Containment

An oil containment assessment is carried out at for all new stations and station modifications to determine the level of containment required. For the Project, no long-term storage of insulating oil during construction is anticipated. Insulating oil will be brought to the sites as required. Oil containment for the expansions will follow the existing stations' oil containment plans. These could include a combination of non-point and point containment for oil-filled equipment. Non-point containment for small equipment is managed by surface grading. Point containment is required for large equipment containing greater than 5,000 litres of oil. Point protection consists of containment pits around the equipment, which drain to oil/water separators, capturing and retaining any potential contaminates.

2.5.5.4 Station Grounding

The primary purpose of station grounding is to ensure personnel, public and equipment safety through a grounding grid. The grounding grid ensures that people inside and outside of a station are not exposed to critical electrical shock under normal and/or fault conditions. Furthermore, it also provides a means to bond the equipment to ground. The Canadian Electrical Code requires that all metallic objects in an outdoor station be bonded to ground. A grounding grid is made up of mesh copper conductors and ground rods buried in the station soil. The grounding grid system normally encompasses the entire station site and extends one meter past the station fence and gate swings.

Glenboro South Station

Within the Glenboro South Station expansion area, the installation of additional station ground grid will be required to accommodate the PSTs, addition of steel structures, relocation of existing equipment and the fence extension. The grid comprises numerous copper clad steel ground rods (approximately three metres in length) driven into the ground, connected below insulating stone surface with bare copper wire and connected to metallic objects such as steel structures, equipment and foundations. The ground grid is required for personnel and equipment safety, and will conform to Manitoba Hydro standard practices for station design. The extension will be integrated with and, where necessary, will supplement the existing ground grid network.

Dorsey and Riel Converter Stations

At the Riel and Dorsey Converter Stations, the ground grids will also be expanded and tied into the existing system to account for the new equipment and provide equipment grounding connection points. As a result of the expansion, additional copper conductors, ground rods and switch mats will be installed.

2.5.5.5 Station Protection

Dorsey Converter Station

New protection systems will be installed for all new switchyard equipment including the IPL and line reactors. Protection for the Dorsey IPL will be designed to permit Single Pole Trip and Reclose (SPTR) of the 500 kV transmission line.

Riel Converter Station

New protection systems will be installed for all new switchyard equipment including the new power transformer and capacitor banks. New equipment installed in the 230kV AC switchyard will include a circuit breaker, current transformers, disconnect switches, and protection relays. New equipment installed in the 500 kV AC switchyard will include auto-transformers, a power circuit breaker, current transformers capacitive voltage transformers, numerous disconnect switches, numerous metal oxide varistor (MOV) surge arrestors and protection relays.

Glenboro South Station

New protection systems will be installed for the two new PSTs. This includes the following pieces of new equipment in the 230 kV AC switchyard: phase shifting transformers, current transformers, numerous disconnect switches, numerous MOV surge arrestors and protection relays.

2.5.5.6 Communications

Dorsey Converter Station

Work at the Dorsey Converter station includes installation of communication infrastructure at the site (*e.g.,* tele-protection and telemetry). This infrastructure facilitates reliable operation of the transmission line and station related components and is comprised of equipment related to protection and control of the power system and fibre optic cable systems. Protection and control signals that are to be sent to the US (e.g. remote end of line), and to other Manitoba Hydro facilities will utilize existing fibre optic and microwave radio systems, and the new OPGW, as described in Section 2.5.1.1, to be installed as part of this Project.

Glenboro South Station

Relocation of existing buried fibre optic cables and power line carrier coupling equipment may be required as part of the switchyard expansion.

2.5.5.7 Foundations

Concrete piles and slabs on grade foundations will be required to support installation of structures and equipment at the stations. Foundations to attach steel lattice structures to support electrical components and bus work will largely consist of concrete caps on deep piles at all column locations. Piles will be designed to resist frost heaving; the depth of the piles will be approximately 10 m deep. The piles will be approximately 600 mm to 1050 mm in diameter. The piles will be either cast-in-place or driven piles. Cast-in-place piles consist of drilling a shaft into the soil, placing a reinforcing cage and filling it with concrete. Driven piles are precast concrete which are driven into the ground mechanically to achieve design parameters. Slab on grade foundations without piles will also be used for low-seated equipment such as station service transformers. Slab-on-grade foundations can vary in size dependent on equipment footprint but typically can range 2 m x 2 m or more. Slab on grade foundations supported by multiple piles are often used for stand-alone equipment such as air circuit breakers, transformers, switches and reactors, for example.

2.5.5.8 Steel Structures

A variety of steel structures will be installed at the sites for new equipment. Stand-alone equipment required for the station will have steel supporting structures that are manufactured supplied and then attached to foundations (*e.g.,* breakers). Tubular steel stand structures will also be used to support the following types of equipment at the station that will be installed – CTs, PTs, arrestors, and wave traps. The tubular steel structures will range in height from 3 to 7 m. Steel lattice structures are typically taller to accommodate clearances for required voltages on equipment such as bus conductors and will be used for the installation of new equipment. Steel lattice structures will be approximately 6 to 15 m tall, depending on the equipment the structures are supporting.

2.5.5.9 Station Lighting

Dorsey Converter Station

Lighting expansion required for the station expansion includes the installation of an additional two 150 W perimeter light masts as a result of the station fence expansion and four 750 W HPS floodlights mounted on new steel structures.

Riel Converter Station

Lighting expansion required for the station modifications includes the installation of four additional 1,000 W HPS lights mounted on existing steel structures.

Glenboro South Station

Lighting expansion required for the MMTP (230 kV Phase Shifter Installation) includes the installation of an additional twelve 250 W HPS floodlights mounted on new steel structures.

2.5.5.10 Transmission and Distribution Line Relocation and Salvage

Directly east of Glenboro South Station, the S53G (Stanley to Glenboro)/G37C (Glenboro to Conwallis) intraprovincial transmission line will need to be relocated approximately 30 m north of its existing location to accommodate the Glenboro South Station expansion. One steel lattice tower will be salvaged and two new towers will be added to terminate the transmission line. The length of S53G/G37C in its new location is approximately 660 m. Easements will also be required for this transmission line. In addition to the above, four 66 kV, and one 8 kV distribution lines will also need to be relocated at the site along with rerouting a fibre optic cable.

2.5.5.11 Relocation of Existing Equipment

Existing 230 kV equipment will need to be relocated in the Glenboro South Station yard to accommodate the two PSTs. The relocated equipment will be moved approximately 128 m to the east of its present location. The following existing equipment will be relocated into the new expanded station fenced area: 230 kV breaker, 230 kV circuit switcher, 230 kV shunt reactor, 230 kV capacitive voltage transformers (CVT), wave traps and 230 kV arresters. Relocated components within the 230 kV yard will include all the necessary concrete foundations, steel structures and equipment supports. Equipment foundations will range from concrete slab-on-grade to deep piled foundations, depending on equipment weight and geotechnical conditions. Steel structures will be placed on the foundations and will support electrical apparatus and electrical conductors, and hardware associated with the switchyard. Additional grounding will also be installed for the relocated equipment.

2.5.6 Station Operation and Maintenance

Once work has completed, the stations will operate as they have to date operating 24 hours a day, year round, and some will have a combination of permanent Manitoba Hydro personnel on site (Riel and Dorsey Converter Stations; no permanent staff are needed at Glenboro South Station) performing regular operation, maintenance and inspection duties. Qualified operators and maintenance personnel will routinely inspect and maintain the sites and, in the case of contingencies, correct any problems or related environmental effects.

2.5.7 Station Decommissioning

In the extremely unlikely event that any of the stations were to be decommissioned, the process would be subject to development and approval of appropriate procedures which, in turn, would be subject to applicable regulatory requirements in place at the time. The overall objective of any decommissioning plans would be to restore the station site to a condition consistent with the future intended use of that site. Station components and site improvements would be salvaged, removed and disposed of in compliance with all relevant regulations. Depending on the extent of any surface contamination on site (*e.g.,* petroleum contamination in soils), remediation would occur to correct any residual impact. A careful investigation of containment parameters, future land use, site risks, and remedial technologies would be conducted as part of the development and implementation of a remedial action plan.

3 Nature of Lands to be Crossed

3.1 General

The Project is proposed to be located in a region of southern Manitoba in which the original native ecology has been substantially affected for more than one hundred years by human development. This change has been dominated by conversion of native prairie to agricultural lands, accompanied by urban and rural settlements, public infrastructure, and various other land uses. As such, many natural values on this landscape have been diminished and in some areas, lost. These ecological changes are the consequence of numerous land and resource use decisions by many administrative jurisdictions and governments over an extended period of time; typically in order to advance economic opportunities to support the growing population. As a result, there has been a gradual displacement of natural features.

For the purposes of this document, the “Project region” is defined as the broad area of southeastern Manitoba where the Project is located. The “Project footprint” is the area physically disturbed (i.e., underneath) the Project (including the ROW), and the “local area” is the area adjacent to the Project footprint where most potential effects would occur.

As indicated, the majority of land in the Project region consists of agricultural cropland. Contiguous forest cover encompasses large sections of the eastern portions of the Project region, and cultivation in the eastern portion of the region has been hindered by the presence of mineral soils, peatland and upland mixed forests, where remnant natural characteristics provide opportunities for forestry, recreation and land conservation. Mining activities in the region relate to sand and gravel, quarry extraction and some peat developments. The landscape has been largely influenced by implementation of the section-township-range survey system and the building of roads and railways. Urban areas and settlement centres surrounding the City of Winnipeg have witnessed an increase in rural residential and subdivision development over the past decade, particularly in the RMs of Springfield, Tache, Ste. Anne and La Broquerie. Recreational areas/sites and activities or use are prevalent across the landscape, including campgrounds, resorts, golf courses, parks, tourist attractions, trails (hiking, biking, horseback riding, all-terrain vehicles, cross-country skiing and snowmobiling), wildlife viewing opportunities and hunting and trapping pursuits.

3.2 Land Ownership

Map 7 (Appendix B) displays the land ownership and tenure for the Project region. The majority of land (157 km, or almost 74 %) proposed to be traversed by the Dorsey IPL is privately-owned, but it should be noted that a large portion consists of land either under easement or owned by Manitoba Hydro. Of the total length of the proposed 213 km IPL approximately 92 km (43%) is routed along the existing corridors, involving ROW either under floodway agreement, caveat, easement or owned by Manitoba Hydro (“Existing Corridor ROW”). The remaining 121 km of the route passes through the new ROW segment to the U.S. border (“New Cordidor ROW”). The total length of the route crossing over Crown and agricultural Crown land is approximately 18 km (8.4%) in the Existing Corridor ROW and 37 km (17.4%) in the New Corridor ROW.

The easement for the Existing Corridor ROW will affect approximately 43 provincial Crown properties and seven municipal owned properties within one km of the transmission line. Crown lands within the region for the New ROW include ecological reserves, Wildlife Management Areas and provincial forests. Crown-

owned land encompasses the Red River Floodway through southeast Winnipeg, the RM of Ritchot and the RM of Springfield to Riel. Crown lands leased for agricultural purposes prevail in the eastern portions of the RMs of Springfield and Tache, in scattered pockets in the RM of La Broquerie; the northern, southern and eastern sections of the RM of Stuartburn; and in the north-central and southern portions of the RM of Piney. Parcels of municipal-owned land occur within the RMs of Macdonald and Piney.

Parcels of provincial Crown land that are encumbered within the local area are located in the RMs of Headingley, Springfield and the City of Winnipeg (*i.e.,* Red River Floodway) along the Existing Corridor ROW, and the RMs of Tache, Ste. Anne, La Broquerie, Stuartburn and Piney along the New ROW. The encumbrances[1] are largely concentrated in the RMs of Ste. Anne, La Broquerie, Stuartburn and Piney (Crown Land and Property Agency 2015). Crown land encumbrance types[2] within the local area consist of forage leases/agricultural rental (16), wildlife-Ducks Unlimited Canada lands (5), community licence of occupation (5), forest research plantation (4), fish and game association licence of occupation (2), school land (2) and treaty land entitlement (TLE) notices (2 – part NE5-10-7E, NW4-10-7E). Crown land encumbrances also exist for protected areas, provincial forest, WMAs, quarry leases, and easements for Manitoba Hydro and MTS (Crown Land and Property Agency 2015).

3.3 Land Use

3.3.1 Municipal and Urban Centres

Municipal jurisdiction in the Project region is divided primarily between RMs and urban centres, such as cities, towns and villages. Rural areas may be organized as planning districts, while smaller settlements and communities have no independent municipal status. Development planning for smaller settlements and communities is undertaken at the RM level in the form of development plans and zoning by-laws.

3.3.2 Designated Lands and Protected Areas

Map 8 (Appendix B) displays the designated lands and protected areas for the Project region. Designated lands within the region include provincial parks, a provincial forest, existing Protected Areas and proposed protected areas, ecological reserves, WMAs and Areas of Scientific Interest (see Map 8 – Designated Lands and Protected Areas, Appendix B). There are no national parks or national protected areas located in the Project region. There are no existing First Nation Reserve lands, trust lands or private purchase lands located within the region, but there are First Nation treaty land entitlement (TLE) selections within the region. Peguis First Nation does have a Notice Area under its TLE Agreement that falls within the region. Within this Notice Area, the Province of Manitoba is obligated to notify Peguis First Nation of any proposed dispositions of Crown land. Designated lands along the Existing Corridor local area include Beaudry Provincial Park, Duff Roblin Provincial Heritage Park and the St. Norbert Provincial Heritage Park. The Sandilands Provincial Forest is also located in the local area (see Map 8 – Designated Lands and Protected Areas, Appendix B). Although there are no protected areas in the local area, there are two candidate protected areas along the Existing Corridor ROW: the proposed Assiniboine River Clam Beds Protected Area, and a protected area located at Deacon's Corner north of PTH 1E (SW14-10-4E) in the RM of Springfield. Protected areas within the local area along the New Corridor ROW are the

[1] A charge or lien on land other than a mortgage property.

[2] Number of parcels or quarter sections provided based on section-township-range.

Watson P. Davidson WMA and the Spur Woods WMA. There are 15 candidate protected areas or ASIs in this part of the local area, including the Balsam Willows candidate protected area in the RM of Ste. Anne.

3.3.3 Recreation

Map 9 (Appendix B) displays the recreational land use for the Project region. Recreational activities and facilities consist of hiking/biking and horseback trails, ATV trails, golf courses, lodges, campgrounds, resorts, parks, recreational angling, boating and canoeing, cross-country ski trails and snowmobile trails and shelters.

Named recreational trails located in the local area along the Existing Corridor ROW and New Corridor ROW segments include the Duff Roblin Parkway, located along the Red River Floodway in the City of Winnipeg, and the Winnipeg Trail and Crow Wing Trail – parts of the Trans Canada Trail, located at the Courchaine Bridge near Duff Roblin Provincial Heritage Park and at St. Norbert Provincial Heritage Park in the City of Winnipeg. Within the local area there is one campground resort, the Traveller's RV Resort located along the SLTC within the RM of Springfield north of PTH 100 (Manitoba Association of Campgrounds and Parks 2014). Southeastern Manitoba has numerous golf courses, with four following being located within the local area.

The Dorsey IPL crosses the Assiniboine River and Red River at two separate locations: in the RM of Headingley and in the City of Winnipeg at its southern limit. Both the Assiniboine and Red rivers are navigable waters. Two designated canoe routes are located in the local area, on the Red River and the Rat River. Boating and fishing occur along both rivers.

There are two private wildlife areas within the local area. The Seven Oaks Fish & Game Association owns a parcel located in the RM of La Broquerie in SW32-5-8E and leases adjacent Crown land in the west half of 29-5-8E. This association has developed the area with walking trails, a clubhouse, warm-up shelters and an open shooting area. The second private wildlife area is also located in the RM of La Broquerie west of the Watson P. Davidson WMA, in sections 27/28-4-8E and is used for hunting and wildlife viewing.

3.3.4 Hunting and Trapping

As displayed in Map 10 (Appendix B), the proposed route for the Dorsey IPL and the locations of the existing Dorsey and Riel Converter Stations are within Open Trapping Area Zones 1, 3 and 4. The Glenboro South Station LAA is located within Open Trapping Area Zone 1. No individual registered traplines are registered within the region. As shown in Map 11, the Existing Corridor ROW and New Corridor ROW are located within the following Manitoba Game Hunting Areas (GHAs): 25B, 33, 34A, 35 and 35A. The Local area for Glenboro South Station is located within GHA 31A.Mining/Aggregates

As displayed in Map 12 (Appendix B) mineral areas within the Project local area for the New Corridor ROW include seven quarry leases, 10 quarry withdrawals, 29 casual quarry permits, 24 private quarry permits, and one peat mine. Within the LAA along the Riel–Vivian corridor, there are 14 mineral areas, one quarry withdrawal and 13 private quarries (10 of which are concluded). Within the Existing Corridor Project footprint there are: five mineral areas, one quarry withdrawal, one private quarry, and three concluded private quarries. Within the Project footprint along the New Corridor ROW, there are three quarry withdrawals and seven private quarries (three of which are concluded).

3.3.5 Forestry

Map 13 (Appendix B) shows productive forestland in the Project region. This is an index map and the map series can be found in Chapter 16 of the EIS. It shows that commercial timber harvesting occurs predominately in the Agassiz and Sandilands provincial forests in the southeast portion of the Project region. With the exception of a few locations north and east of Sundown and at the Piney border crossing, the Project footprint lies outside of the Provincial Forest area. The area intersected by the Project footprint south of PR 12 is predominately Crown land where commercial timber harvesting occurs to a lesser extent. The local area occurs within FMUs 1 and 24 of the Aspen Parkland and Pineland Forest Sections.

4 Aboriginal and Public Consultation

Manitoba Hydro has carried out a lengthy and extensive pre-regulatory consultation program for the Project, providing opportunities for First Nations, Métis, Aboriginal organizations, local landowners, local municipalities, stakeholder groups, government departments and the general public to participate in shaping decisions about the Project. Consultation was effected through the development and implementation of two separate engagement processes – a public engagement process and a First Nation and Métis engagement process. While certain engagement methods and materials were distinctive to a particular engagement process (as detailed in sections 5 and 6 of this Project Description), several materials were developed for use in both the public and First Nations and Métis engagement processes. These materials were developed to cover a broad range of topics regarding the Project and Manitoba Hydro. Certain materials were updated throughout each round of the engagement processes to provide updated information as it became available. The material developed was provided at public events and was and still is available under “Document Library”on the Project website:

https://www.hydro.mb.ca/projects/mb_mn_transmission/regulatory_filings.shtml

The following is a list of the types of materials that were developed for use in both engagement processes:

- Project-specific information: These included quick fact sheets, newsletters, storyboards, compensation information, response material to certain topics raised throughout the engagement processes, question and answer handouts, and comment sheets.
- Maps: detailed maps of various sizes were provided. These were topographic and satellite imagery maps.
- Electric and magnetic fields: Material developed regarding EMF included anticipated field levels, stray voltage booklet, general information on alternating current and a handout regarding alternating current and electronic devices. Other handouts that were provided included a “Consensus Statement” from the Clean Environment Commission (Manitoba), Health Canada “It’s Your Health” and a document from the International Commission on Non-Ionizing Radiation.
- Manitoba Hydro Project videos: three videos were developed to outline the regulatory, environmental assessment, route selection and engagement processes that will be undertaken for the Project.
- National Energy Board pamphlets: Provided NEB handout “Information for proposed pipeline or power line projects that do not involve a hearing”.

- Transmission Line Routing: A route selection brochure was developed for Rounds 2 and 3 of the engagement processes that outlined the process of how Manitoba Hydro would be determining a final preferred route for the project.
- Environmental Assessment: Various handouts regarding valued components and the regulatory review process were developed. The “VC Handouts” outlined why the valued components were being assessed, what the potential effects may be, what studies were being undertaken, and preliminary mitigation methods.
- Posters: A project overview poster was developed as well as a Socio-economic and Biophysical poster. These outlined various aspects of the Project and introduced the environmental assessment work being undertaken for the Project.
- General information: Material outlining career opportunities, Manitoba Hydro’s development plan and ROW maintenance handouts were provided to participants.

5 First Nation and Métis Engagement Process

5.1 Overview

Manitoba Hydro’s First Nation and Métis engagement process (“FNMEP”) refers to the engagement process that was developed by Manitoba Hydro to communicate Project information to First Nations, Métis and Aboriginal organizations and to receive their feedback and concerns regarding potential effects of the Project. As discussed in more detail below, the engagement included leadership meetings, open houses, field visits, letters, phone calls and understandings from self-directed studies. To demonstrate understanding and appreciation of the diversity of First Nation and Métis cultures and worldviews, Manitoba Hydro uses throughout this section, whenever possible, specific terminology when referring to First Nations or Métis. While it might have been simpler to have used the term “Aboriginal”, Manitoba Hydro has heard a preference, from First Nations in particular, about distinguishing First Nation concerns by describing them as “First Nations.”

The FNMEP for the Project began in August 2013, more than two years in advance of the filing of the EIS for the Project, and will extend through Project construction and operation. Manitoba Hydro first created opportunities for First Nations, Métis and Aboriginal organizations to shape the engagement process to best suit their needs. Then, through multiple rounds of engagement, Manitoba Hydro presented the Project, created opportunities to collect and listen to feedback, shared understandings, toured key Project areas, and received information. Manitoba Hydro respected different approaches for engagement and provided opportunities during the FNMEP for participants to review how information informed the Project. Project engagement included eleven First Nations, the Manitoba Metis Federation, and four Aboriginal organizations. The four Aboriginal organizations have interests or mandates related to the Project region. As part of the engagement process, some First Nations chose to develop traditional knowledge studies, and some did not; some chose to act collaboratively with others, while others opted to work by themselves; and some chose to conduct studies later on in the engagement process.

5.2 Identification and Description of Participants

Manitoba Hydro considered a number of factors in determining who to contact regarding participation in the FNMEP, including:

- Declaration of interest in the Project by the participant;
- Treaty 1 signatories (Project is located in Treaty 1 Territory);
- In proximity to the Project region (40 km);
- Located within Treaty1 area but not a party to the numbered treaties; and
- Aboriginal Organizations with interests or mandates related to the Project region.

Based on these factors, Manitoba Hydro contacted the following First Nations, the MMF and Aboriginal organizations at the outset of the FNMEP:

First Nations, Metis and Aboriginal Organizations	**Rationale for Engaging in the Project**
First Nations	
Black River First Nation	Interest in the Project
Brokenhead Ojibway Nation	Signatory to Treaty 1
Buffalo Point First Nation	Proximity to the study area
Dakota Plains Wahpeton First Nation	Located within Treaty 1 area and interest in the Project
Dakota Tipi First Nation	Located within Treaty 1 area and interest in the Project
Long Plain First Nation	Signatory to Treaty 1 and interest in the Project
Peguis First Nation	Signatory to Treaty 1 and interest in the Project
Roseau River Anishinabe First Nation	Signatory to Treaty 1 and interest in the Project
Sagkeeng First Nation	Signatory to Treaty 1 and interest in the Project
Sandy Bay Ojibway First Nation	Signatory to Treaty 1
Swan Lake First Nation	Signatory to Treaty 1 and interest in the Project
Metis	
Manitoba Metis Federation	Interest in the Project
Aboriginal Organizations	
Aboriginal Chamber of Commerce	Aboriginal Organization with interests/mandate in Project region
Assembly of Manitoba Chiefs	Aboriginal Organization with interests/mandate in Project region
Dakota Ojibway Tribal Council	Aboriginal Organization

Southern Chiefs Organization	Aboriginal Organization with interests/mandate in Project region

Manitoba Hydro subsequently identified two First Nations, Iskatewizaagegan 39 Independent First Nation and Shoal Lake 40 First Nation, that may have an interest in the Project and sent letters to these First Nations on July 21, 2015. Manitoba Hydro was prepared to engage with other parties not on the list if it came to the Corporation's attention that they might have an interest in this Project.

The following is a description of First Nations and the MMF who were engaged for the Project, obtained from their websites and/or Aboriginal and Northern Development Canada:

Black River First Nation

Black River First Nation is a signatory to Treaty 5. Black River First Nation has one reserve, Black River 9 (809 ha), located approximately 120 km northeast of Winnipeg and 103 km from the Project. As of May 2015, Black River First Nation had a registered population of 1,277 (AANDC 2015a). The primary language used is Ojibwe (BRFN 2015).

Brokenhead Ojibway First Nation

Brokenhead Ojibway Nation is a signatory to Treaty 1. Brokenhead Ojibway Nation has three reserves: Brokenhead 4 (5,413 ha), Birch Landing (272 ha) and Na-Sha-Ke-Penais (3 ha). Brokenhead Ojibway First Nation's main reserve, Brokenhead 4, is located approximately 64 km northeast of Winnipeg and 46 km from the Project. As of May 2015, the registered population is 1,935 (AANDC 2015b).

Buffalo Point First Nation

Buffalo Point First Nation is a signatory to Treaty 3 and is located on the shores of Lake of the Woods in the southeastern corner of Manitoba at the Canada and United States international boundary across from Warroad, Minnesota (BPFN 2015). Buffalo Point First Nation has six reserves: Agency 30 (379 ha), Buffalo Point 36 (2,332 ha), Buffalo Point First Nation 1 (37 ha), Buffalo Point First Nation 2 (347 ha), Buffalo Point First Nation 3 (92 ha), and Reed River 36A (1,162 ha). Buffalo Point First Nation is located approximately 27 km from the Project. The registered population as of May 2015 was 128 (AANDC 2015c). The native language is Chippewa (BPFN 2015).

Dakota Plains Wahpeton First Nation

Dakota Plains Wahpeton First Nation Reserve 6A (10 ha) is located approximately 104 km southwest of Winnipeg and 75 km from the Project. In 1972, the Sioux Village settlement divided into two separate groups creating the presently known Dakota Tipi First Nation and Dakota Plains Wahpeton First Nation. The main language spoken is Sioux, followed by Ojibway (DPWN 2015). The registered population as of May 2015 was 268 (AANDC 2015d).

Dakota Tipi First Nation

Dakota Tipi First Nation has one reserve, Dakota Tipi 1 (59 ha), located approximately 80 km west of Winnipeg and 65 km from the Project. The registered population as of May 2015 was 395 (AANDC 2015e). In 1972, the Sioux Village settlement divided into two separate groups creating the presently

known Dakota Tipi First Nation and Dakota Plains First Nation. Although the native language is Sioux, the majority of people speak English (DTFN 2015).

Long Plain First Nation

Long Plain First Nation is a signatory to Treaty 1 and has two reserves: Long Plain 6 (4,383 ha) and Long Plain Madison Indian Reserve No. 1 (1 ha). The main reserve, Long Plain 6, is located approximately 30 km southwest from Portage la Prairie, 100 km west of Winnipeg and 64 km from the Project. The registered population as of May 2015 was 1,491 (AANDC 2015f). The main languages spoken are English and Ojibway (LPFN 2015).

Peguis First Nation

Peguis First Nation is a signatory to Treaty 1. Peguis First Nation has 30,655 ha of reserve land located 190 km north of Winnipeg and approximately 135 km from the Project (AANDC 2015g). Peguis First Nation is the largest First Nation community in Manitoba (PFN 2015); the registered population as of May 2015 was 9,852 (AANDC 2015g).

Roseau River Anishinabe First Nation

Roseau River Anishinabe First Nation is a signatory to Treaty 1. Roseau River Anishinabe First Nation has three reserves: Roseau River 2 (2,224 ha), Roseau Rapids 2A (323 ha) and Roseau River 2B (30 ha). Roseau River 2, the main reserve, is located at the junction of the Red and Roseau rivers and is located approximately 80 km south of Winnipeg. Roseau Rapids 2A is located on an escarpment 32 km east of the main reserve. Roseau River 2B is located at the junction of Provincial Trunk Highway (PTH) 6 and Provincial Road (PR) 236 and the Perimeter Highway on the northwest side of Winnipeg.. The registered population as of May 2015 was 2,579 (AANDC 2015h).

Sagkeeng First Nation

Sagkeeng First Nation is a signatory to Treaty 1. Sagkeeng First Nation has one reserve, Fort Alexander 3 (8,771 ha), located approximately 122 km northeast of Winnipeg and approximately 75 km from the Project. The registered population as of May 2015 was 7,651 (AANDC 2015i).

Sandy Bay Ojibway First Nation

Sandy Bay Ojibway First Nation is a signatory to Treaty 1. Sandy Bay Ojibway First Nation has one reserve, Sandy Bay 5 (6,659 ha), located approximately 165 km northwest of Winnipeg, 90 kilometers from Portage la Prairie and 102 km from the Project. Agricultural activities, such as farming, are important to the community with approximately three quarters of the reserve land used for agriculture. The main language spoken is Ojibway (SBOFN 2015). The registered population of May 2015 was 6,426 (AANDC 2015j)

Swan Lake First Nation

Swan Lake First Nation is a signatory to Treaty 1 and is located in south central Manitoba. The main reserve, Swan Lake 7 (3,116 ha) is located approximately 120 km southwest of the Winnipeg and 159 km from the Project. The registered population as of May 2015 was 1,385 (AANDC 2015k)

Manitoba Metis Federation

The Manitoba Metis Federation was founded in 1967 by a group of Métis who wanted to advocate for the rights of the Métis people of Manitoba (Manitoba Metis Federation 2015). As per the Manitoba Metis Federation Constitution (2013), their objectives are to promote the history and culture of the Métis people, promote the education of its members and the participation of its members in community and governance, as well as to further the political, social and economic interests of its members. As of 2011, 78,830 persons in Manitoba identified as Métis (Statistics Canada 2013).

5.3 Design and Scope of the FNMEP

5.3.1 Design

Manitoba Hydro designed the FNMEP for the Project to engage First Nations, Métis and Aboriginal organizations early in the process and at every stage. The FNMEP was adaptive and flexible, with opportunities for input provided at every stage to meet the specific context of each group in order to achieve meaningful participation. The FNMEP was coordinated with the routing methodology to provide information and gather feedback at key stages of transmission line routing. The FNMEP conducted by Manitoba Hydro included several stages, incorporating a wide variety of communication methods as described below.

5.3.2 Process

Pre-engagement (August 2013 – September 2013)

Manitoba Hydro sent an initial letter of invitation to First Nations, the MMF and Aboriginal organizations identified as participants. Manitoba Hydro followed up with phone calls or emails to ensure receipt of the initial letters and to schedule and confirm leadership meetings and open houses/information sessions. Some First Nations began discussions regarding ATK at this early stage, including Peguis First Nation and Roseau River Anishinabe First Nation.

Round 1 (October 2013 – Aprill 2014)

Manitoba Hydro provided First Nations, the MMF and Aboriginal organizations with the opportunity to provide feedback to assist in the evaluation of the alternative routes presented, and the identification of a preferred border crossing for the Dorsey IPL. In total, 19 leadership meetings, open houses and information sessions were held during this round of engagement with interested parties. Discussion regarding ATK studies began in earnest with Long Plain First Nation, Sagkeeng First Nation and the MMF.

Round 2 (April 2014 – August 2014)

Manitoba Hydro presented the preferred border crossing for the Dorsey IPL with alternative routes to First Nations, the MMF and Aboriginal organizations, with opportunity to share concerns and perspectives. A further 43 leadership meetings, open houses/information sessions, and workshops, were held with those interested in participating. At the beginning of this round, discussions regarding ATK studies began with Black River First Nation, Dakota Plains Wahpeton First Nation, Dakota Tipi First Nation, and Swan Lake First Nation. By the end of the round the ATKS Management Team (Black River First Nation, Long Plain First Nation and Swan Lake First Nation), Dakota Plains Wahpeton First Nation, Peguis First Nation and Roseau River Anishinabe First Nation had started their ATK studies. Discussions continued with Sagkeeng First Nation and the MMF about conducting their respective ATK studies. Field visits were

coordinated with Manitoba Hydro and members of the ATKS Management Team (Swan Lake, Long Plain and Black River First Nations). Two supporting studies were initiated by the ATKS Management Team, including the Archeology and Botanical studies.

Near the end of Round 2 Dakota Plains Wahpeton First Nation informed Manitoba Hydro that they would not be completing their ATK study as planned.

Round 2 Border Crossing Modification

Following the completion of Round 2, discussions between Manitoba Hydro and Minnesota Power resulted in a border crossing modification. Based on the border crossing modification, Manitoba Hydro provided this new information to First Nations, the MMF and Aboriginal organizations to obtain additional feedback on this modification. With the proposed border crossing modification, Manitoba Hydro also presented new alternative route segments to connect to the Manitoba–Minnesota border.

Round 3 (January 2015 – September 2015)

Manitoba Hydro presented the preferred route for the Dorsey IPL based on the environmental assessment and input received during previous rounds. Manitoba Hydro gathered further feedback to consider any final adjustments to the route prior to finalizing the environmental impact statement (EIS) for the Project. A further 28 leadership meetings, community open houses/information sessions, workshops, and field visits continued. Discussions continued with the MMF about conducting an ATK study. Dakota Plains Wahpeton First Nation decided to reinitiate ATK studies with new representation. Dakota Tipi First Nation and Sagkeeng First Nation started their ATK studies. The ATKS Management Team, Peguis First Nation and Roseau River Anishinabe First Nation submitted draft ATK reports.

5.3.3 Methods of Engagement

The level and methods of engagement depended on the response from the MMF and each First Nation, and Aboriginal organization. In addition to the materials described previously, Manitoba Hydro offered a number of engagement methods and tools as a way to provide more direct opportunities for input.

Leadership Meetings

Leadership meetings provided opportunities for early and ongoing engagement regarding the Project. These meetings were held with interested participants to communicate Project activities, receive feedback, and discuss engagement plans and concerns.

Community Open Houses/Information Sessions

Community open houses provided participants with the opportunity to access information and provide feedback about the Project directly to Manitoba Hydro representatives, and were held at various stages of the Project. This method of engagement also provided an opportunity for direct discussions with members. A wide variety of information was communicated and provided at the community open houses through methods such as Project storyboards, Project newsletters, brochures on EMF, brochures on the routing process, handouts on the valued components, localized mapping sessions and comment sheets.

Telephone Calls

Manitoba Hydro staff routinely phoned First Nations, the MMF and Aboriginal organizations to confirm receipt of letters, schedule meetings and community open houses/information sessions and provide Project updates.

Community Coordinators

Of the 11 First Nations participating in the Project, Manitoba Hydro offered funding to nine First Nations to hire a part-time Community Coordinator. The roles and responsibilities of the Community Coordinator were to:

- Keep the leadership informed of the planning and engagement activities regarding the Project;
- Maintain contact with Manitoba Hydro to discuss upcoming activities, offer advice, report progress and relay concerns raised by the leadership and members;
- Help Manitoba Hydro to understand and address concerns early on in the engagement process, help facilitate input, and resolve issues; and
- Organize, promote and facilitate attendance and participation in community open houses/meetings/workshops and other related engagement events for the Project held with their respective First Nation.

The other two First Nations had already been offered funding to hire Community Coordinators through past Projects. These existing funding agreements were extended to include the work for the Project. Manitoba Hydro also currently funds a Manitoba Hydro Liaison Officer at the MMF.

ATK Studies

Manitoba Hydro offered First Nations and the MMF the opportunity to conduct self-directed ATK or land use and occupancy studies by providing funding for these studies. First Nations that indicated an interest in undertaking a study and the MMF were invited to submit a proposal. An ATK proposal template was developed and shared with those who requested assistance with the development of a proposal for a study. Manitoba Hydro staff also met with First Nations that requested assistance to help with the development of the proposal, if assistance was requested.

Manitoba Hydro offered the studies to help inform the environmental assessment and routing processes, and to develop a better EIS and Environmental Protection Program for the Project. The ATK that was shared through the studies assisted Manitoba Hydro with:

- Developing a greater understanding of the Project area;
- Identifying key concerns in the study area;
- Identifying potential Project effects;
- Planning and designing the Project; and
- Developing potential mitigation measures.

Routing Workshops

During Rounds 1 and 2, Manitoba Hydro held routing workshops with representatives from Long Plain First Nation, Swan Lake First Nation and Roseau River Anishinabe First Nation to learn about specific site concerns and preferences. Manitoba Hydro hosted a Round 1 Preliminary Routing discussion with representatives of Swan Lake First Nation and Long Plain First Nation on January 24, 2014. Manitoba Hydro continued the Round 1 Preliminary Routing discussion on January 31, 2014, with representatives of Swan Lake First Nation and Roseau River Anishinabe First Nation. In Round 2, representatives from Manitoba Hydro met with members from Roseau River Anishinabe First Nation on November 13, 2014.

Stakeholder Workshop

In November, 2013 Manitoba Hydro invited First Nations and the MMF to participate in workshops. The workshops began with a presentation that outlined the purpose of the Project and described the transmission line routing, environmental assessment and public engagement processes. These workshops were opportunities for participants to:

- Determine route selection criteria most important to stakeholder groups;
- Identify preferences and concerns regarding the alternative routes and preferred border crossings;
- Address the route selection criteria and suggest modifications;
- Determine local issues and concerns; and
- Discuss mitigation strategies.

The participants were asked to identify their issues and concerns, particularly those based on local knowledge of the Project region, and to share concerns regarding the transmission line routing and environmental assessment processes.

Project Site Tours and Tours of Similar Projects

Manitoba Hydro organized a field tour with the ATKS Management Team (Black River First Nation, Long Plain First Nation and Swan Lake First Nation) during fall 2014 to investigate alternative route locations.

At the request of the Dakota Tipi First Nation, Manitoba Hydro and members from the First Nation toured parts of the preferred route during spring 2015. The day included a stop at a historic site around the Poplar Point area, a stop at both Dorsey and Riel Converter Stations to better understand where the line would originate and see an example of a Project construction area (construction work for the Bipole III Transmission Project was underway during the field visit).

Sagkeeng First Nation also requested a field tour. During summer 2015, members of Sagkeeng First Nation and Manitoba Hydro and their wildlife consultant toured parts of the preferred route. The visit included visiting the Riel Converter Station, sections of the Riel IPL ROW where the Dorsey IPL will parallel a similarly-sized transmission line near the Project, and areas of the Project preferred route east of Riel to the south end of the Watson P. Davidson Wildlife Management Area.

Roseau River Anishinabe First Nation (RRAFN) conducted a field visit during summer 2015. The visit included touring privately owned land that is currently being used by First Nations, including RRAFN, to collect medicinal plants.

Reviewing and Confirming Information

Manitoba Hydro provided and will continue to provide the opportunity for participants to review and confirm information provided through the FNMEP by:

- Sharing draft meeting notes with participants to provide an opportunity to review and provide revisions;
- Providing opportunities for those First Nations who provided traditional knowledge to confirm interpretation of the information by sharing their individual sections of the First Nation and Metis Engagement Process Chapter of the EIS;
- Offering to hold EPP meetings with First Nations, the MMF and interested Aboriginal organizations to provide an opportunity to demonstrate how input, including local and traditional knowledge, has been considered and interpreted, and how concerns that were identified were addressed; and,
- Continuing engagement after filing of the EIS and reviewing the mitigation measures to discuss whether they address concerns.

Manitoba Hydro reviewed input received by:

- Meeting with those responsible for preparing ATK reports to discuss report content, confirm understandings and seek clarification where needed;
- Coding the meeting notes by category to facilitate better understanding of interests and concerns;
- Providing meeting notes to Manitoba Hydro specialists, when appropriate, to ensure relevant input is incorporated into the EIS and to provide context for the EIS; and
- Augmenting the environmental assessment with traditional knowledge and integrating the information and knowledge, where appropriate, into the design of the Project.

Templates, Checklists and Work Plans

Manitoba Hydro developed tools to improve the FNMEP. These tools included the following:

- Draft sample engagement work plan (Appendix 4D of the EIS) – the draft sample work plan sent to First Nations on December 6, 2013 outlined potential opportunities for participating such as conducting an ATK study or workshop. Manitoba Hydro representatives explained that proposals initiated by the First Nation were welcomed, and that a sample proposal was available to assist with proposal development, if required.
- ATK proposal template (Appendix 4E of the EIS) – the template was intended to be a general guide for those seeking assistance in developing a proposal (including a work plan and budget) to carry out an ATK study for the Project.
- ATK draft protocol (Appendix 4F of the EIS) – the Draft Protocol was developed to help guide meetings and discussions on matters related to ATK. The protocol was intended to build understanding of the following: Manitoba Hydro's process to gather and share ATK; how Manitoba Hydro will use ATK information; Manitoba Hydro's view on ownership of the information; and how Manitoba Hydro protects and stores ATK information, if applicable.

- ATK Table of Contents template (Appendix 4G of the EIS) – a final report outline template was developed in response to requests by those seeking clarification on what information to include in a final ATK Report. It was intended to provide an example of what to include by way of an 'annotated' table of contents outline. Manitoba Hydro representatives encouraged First Nations to revise the template to make it more suited to their specific study and advised that not all of the categories included may be applicable.
- Community-specific engagement checklist (Appendix 4H of the EIS) – a checklist was shared with First Nations as a way for Manitoba Hydro to ask First Nations how they wanted to be engaged and what the best way(s) were to keep them informed.

5.4 Methods for Sharing Information

Manitoba Hydro endeavoured to, and will continue to, communicate in a format and manner that is clear, timely and relevant to First Nations, the MMF and Aboriginal organizations. The Corporation began communicating Project information at the early stages of engagement, in August 2013. Manitoba Hydro used the engagement materials described in section 4 of this Project Description as well as the following communication tools to provide information on the Project.

Letters

Manitoba Hydro sent letters through non-registered or ExpressPost/registered mail, as a tool to formally notify First Nations, the MMF and Aboriginal organizations of Project-related activities. The letters were accompanied with packages of Project material, including Project Newsletters and maps. Letters were sent as Project updates or new Rounds of engagement were initiated, and often to formally request a meeting, or as notification of upcoming engagement activities. Registered letters were sent in Round 3 to ensure receipt of communication about this key stage of Project assessment. All letters included contact information for the Project, consisting of a phone number, email address, and the Project web page address to provide recipients with additional sources of information on the Project and methods for contacting Manitoba Hydro. Letters were often followed up with a phone call to confirm receipt and answer any potential immediate questions.

Advertisement in Local Newspapers

Newspaper advertising for the public open house events were printed in the *Winnipeg Free Pr*ess and *Winnipeg Sun*. Advertisements also appeared in *Grassroots News*. Letters to First Nations, the MMF and Aboriginal organizations indicated that their members were always welcome to attend any of the public open houses. Advertisements were typically in the range of 6" × 11", with the smallest being 5" × 11" and the largest, 7.6" × 11".

Local Radio Spots (Peguis Radio Station and NCI)

One Manitoba radio station, Native Communications Inc. (NCI-FM), ran advertisements for notification of the Project engagement events. The radio advertisements ran during "Metis Hour x2" and "NCI Bingo" on NCI-FM on Saturday, as well as three times daily during weekdays. Advertisements included Project status, upcoming public open houses and contact information. The radio station was selected because it targets First Nation and Metis audiences and has listeners not only in southeastern Manitoba but all

across Manitoba. As a result of Peguis First Nation's recommendation, community information sessions in Peguis First Nation were advertised on the Peguis Radio Station.

Project Web Page

Following the announcement of the Project in June of 2013, Manitoba Hydro launched the Project web page (www.hydro.mb.ca/mmtp). The web page was designed to provide information on the Project and was updated as the Project progressed. It included information on the proposed construction schedule and the regulatory process.

Plain Language EIS Summary

A plain language document is being prepared with the intent to communicate key points of the EIS in non-technical language. In this document, assessment findings will be conveyed clearly and supplemented with photos and illustrations to increase understanding. The document will be made available to First Nations, the MMF, Aboriginal organizations and other groups and individuals who request a copy.

5.5 FNMEP Feedback and Outcomes

5.5.1 Feedback

The following common Project concerns were raised from the various participants during the course of the FNMEP:

- Protection of wildlife and intact natural areas;
- Impacts of construction on unidentified cultural, heritage and burial sites;
- Impact of herbicides on vegetation;
- Adequacy of time to develop ATK reports;
- Impact on future Treaty Land Entitlement ("TLE") selections; and
- Adequacy of the Crown consultation process.

5.5.2 Outcomes

During Round Two, the ATKS Management Team, Peguis First Nation and Roseau River Anishinabe First Nation were in the process of conducting self-directed ATK studies and were able to contribute preliminary findings to help inform the selection of the preferred route. Manitoba Hydro anticipates that the studies conducted by Dakota Plains First Nation, Dakota Tipi First Nation, Sagkeeng First Nation and the MMF will help inform the Environmental Protection Program (EPP) for the Project. First Nations, the MMF or Aboriginal organizations that chose to participate or conduct ATK studies in later stages of the engagement process for the Project were notified that their information would be used to inform the EPP. The status of the various ATK studies is provided in the table below.

ATK Study Status as of September 2015

Who	Began Discussions about Conducting ATK	Started ATK Study	Submitted ATK Report	Next Steps

ATKS Management Team	April 2014	July 2014	May 2015	Discussing potential mitigation measures to address concerns
Dakota Plains Wahpeton First Nation	May 2014	October 2014, September 2015	Pending	Finalizing the Contribution Agreement
Dakota Tipi First Nation	April 2014	August 2015	Pending	Receiving the final report
Manitoba Metis Federation	November 2013		Pending	Continuing to work towards an agreement related to: work to confirm Metis interests in the area; a land use study. Related discussions regarding mitigation
Peguis First Nation	October 2013	September 2014	Draft report June 2015	Receiving the final report
Roseau River Anishinabe First Nation	August 2013	September 2014	July 2015	Discussing potential mitigation measures to address concerns
Sagkeeng First Nation	December 2013	February 2015	July 2015	Discussing potential mitigation measures to address concerns

A key goal of the FNMEP was to integrate perspectives raised through engagement into the routing and assessment process. Through multiple rounds of engagement, FNMEP concerns were incorporated into route preferences by considering both general and specific areas described as important. When available, this information was used in routing workshops, where preferred route determinations took place.

Key general preferences heard thoughout the FNMEP (including avoiding Crown land where possible to protect for TLE selection opportunities, protecting intact natural areas and wildlife, protecting important plant harvest areas, and protecting culturally or historically important sites) contributed to the determination of a border crossing area for the Project. Swan Lake and Long Plain First Nation took part in a Round One Preliminary Routing discussion that resulted in the development of a map that highlighted the cultural and historical importance of areas east of Watson P. Davidson Wildlife Management Area. A Swan Lake First Nation representative indicated that First Nations would place a higher value on the lands closest to the wooded areas (east side) as the wooded areas have hundreds of relevant sites for First Nations. During these early routing discussions, First Nation representatives also indicated a north/south preference by placing a much higher value on the southern zone, indicating they have very little interest in the northern zone other than a small area in the northeast corner of the corridor where Roseau River Anishinabe First Nation indicated interest in TLE. This feedback, along with information received from other interested parties, informed the selection of a border crossing area for the Project.

Several specific routing preferences that were shared through draft ATK studies, preliminary mapping and in the formal rounds of engagement also influenced Manitoba Hydro's selection of the proposed route.

For instance, specific sites identified during the Round One Preliminary Routing discussion noted areas in the Marchand area, a high potential for burials along the border and important sites along the Rat River. Peguis First Nation provided early spatial data indicating the results of land use and occupancy surveys. A map provided by Roseau River during Round Two indicated specific routing preferences in the area between Menisino and the border. These site-specific areas of concern contributed to routing decisions. Roseau River Anishinabe First Nation representatives also expressed concerns about the line traversing a private property that is of importance to the First Nation near Sundown. Manitoba Hydro developed and subsequently adopted a modification as part of the Final Preferred Route. Details concerning other specific outcomes of the FNMEP can be found in Chapter 4 of the EIS.

6 Public Engagement

6.1 Overview

Public engagement was an integral component of the Project. Manitoba Hydro's Public Engagement Process ("PEP") was designed as a multi-stage process that informed stakeholder groups and members of the public about the Project and allowed them to become involved in the routing and environmental assessment work being undertaken.

6.2 Design of Public Engagement Process

6.2.1 General

Manitoba Hydro designed the PEP for the Project to be adaptive and inclusive, offering a wide variety of mechanisms and opportunities for stakeholder groups, affected landowners, local municipalities, government departments and the general public to provide input, have concerns documented and questions answered regarding MMTP. As explained in more detail below, the design of the PEP was influenced by the type of project, the land use of the route planning area (see Map 3-1 in chapter 3 of the EIS), anticipated impacts on land use, feedback from provincial regulators and stakeholders in previous proceedings related to transmission projects, and the input received by Manitoba Hydro during the pre-engagement phase leading up to the PEP.

The basic framework of the PEP was designed to consist of a Pre-Engagement Phase intended to announce the Project, identify interested parties and receive input into the design of the PEP, followed by three rounds of public engagement, tied closely to the transmission line routing process. As a result of a change in the proposed border crossing for the Dorsey IPL, an additional round of engagement was added between Round Two and Round Three to share information and understand potential effects of this modification. Over the course of the pre-regulatory phase of the PEP that lasted from June 28, 2013 through August, 2015, 33 open houses and 16 land owner information centres were held, more than 70 stakeholder and landowner meetings/workshops were convened, and 850 emails/telephone calls were addressed. Engaging with the public and stakeholder groups will continue throughout construction and operation of the Project.

6.2.2 Pre-Engagement Phase

Unlike previous engagement programs for Manitoba Hydro's transmission projects, Manitoba Hydro initiated a preliminary "Pre-Engagement Phase" to seek input into the design of the PEP. This preliminary phase consisted of six components as described below:

News Release

On June 28, 2013 Manitoba Hydro issued a news release in both official languages announcing the Project to 78 different media outlets across the province of Manitoba including newspapers, television stations and radio stations. The news release provided a high-level description of MMTP and and invited input into the planning process. Contact information via telephone and email was included in the release, as well as notice that Project information and online registration would be available on Manitoba Hydro's website. The invitation to provide input preceded Manitoba Hydro's filing of an EIS with the Province of Manitoba by more than two years.

Project Website

On July 2, 2013, a few days after the news release, a webpage dedicated to the Project was launched (www.hydro.mb.ca/mmtp) for the purposes of providing ongoing information regarding the Project, describing federal and provincial regulatory approvals, and soliciting input. Project information on the website included narrative descriptions of the Project (ex: voltage level of IPL, a description of tower design criteria, station modifications, general location of the IPL, a general description of the proposed route, in-service date, purpose of the Project, costs); and maps showing termination points and potential international border crossing locations. The webpage also contained information regarding the environmental assessment, route selection and public engagement processes. The public was invited to complete a questionnaire to assist Manitoba Hydro in refining its PEP and to register for email notification of Project activities. The questionnaire sought input regarding such matters as: preferred methods of providing Project information (ex. open house, letter, social media, etc.), preferred methods of notification of Project activities, preferred times of day and week for open houses and workshops, preferences for online rather than in-person events; preferred methods of providing input and the identification of issues of importance for Manitoba Hydro to be aware of during the engagement process.

Information Line and Dedicated Email Address

Concurrently with the establishment of the MMTP webpage, Manitoba Hydro established a dedicated email address (mmtp@hydro.mb.ca) and a toll-free Project information line (1-877-343-1631) for receiving questions and concerns about the Project. Manitoba Hydro staff undertook efforts to respond to each telephone and email inquiry over the course of the PEP.

Determination of Stakeholder Groups

Manitoba Hydro developed a Master Stakeholder List to track correspondence and stakeholder group information at the onset of the PEP. This list (representing over 150 groups with various interests) was developed through various methods. The initial list was based on the stakeholder list for Manitoba Hydro's Bipole III transmission project that was licensed under Manitoba's *Environment Act* in 2013, as well as stakeholder lists from other recent transmission projects. Both MMTP and Bipole III involve the construction of 500 kV overhead transmission lines that are considered Class 3 developments under *The Environment Act*. Accordingly, similar environmental impacts can be anticipated and therefore similar stakeholder groups. This base list included applicable regulatory personnel from MCWS, as well as its Technical Advisory Committee consisting of representatives from various provincial departments in Manitoba, such as Crown Lands Branch and Parks and Protected Spaces Branch. Municipalities, conservation districts and planning districts within the route planning area were also added to the base

stakeholder list. Finally, Manitoba Hydro conducted internet searches of the websites of local municipalities for potentially interested organizations, including Environmental Non-Government Organizations, and made inquiries of other stakeholders to complete the stakeholder list. An understanding of local interests related to land use in the route planning area (e.g., skidoo clubs, other recreational organizations, wildlife organizations, plant societies, outfitters, historical groups) contributed to the identification of stakeholder groups. Throughout the PEP, stakeholder groups were added as additional interests were identified.

Stakeholder Survey

The fifth step in the Pre-Engagement Phase was the performance of a telephone survey in August of 2013 of all the stakeholder groups identified on the Master Stakeholder List. Following an intial letter that contained general information regarding the Project stakeholders were notified that they would be contacted by telephone to determine their level of interest and their preferred method of engagement. The survey consisted of six questions related to the stakeholder group's level of interest in the Project, whether they were interested in being notified of Project milestones, their interest in attending workshops or open houses, preferred method of contact and the best contact person. If no contact was made after three attempts, the stakeholder group was classified as receiving "information only", unless the stakeholder contacted Manitoba Hydro at a later date to change its level of participation. Through this survey Bipole III Coalition and AMM advised that they did not wish to participate.

Postcards

Postcards were mailed to more than 20,000 residents within the route planning area in October of 2013 providing notice of the proposed Project and the MMTP webpage. Residents were also invited to complete the online pre-engagement survey and to register for receiving future email notifications in order to keep informed about Project developments.

6.2.3 Public Engagement Rounds

The Pre-Engagement Phase was followed by three full rounds of public engagement and an additional round concerning a change in the proposed border crossing. The transmission line routing process was coordinated with the Public Engagement Process in order to provide information and gather feedback at key stages in the determination of a preferred route. Each round of the PEP consisted of a combination of the following: public open houses, land owner information centres, stakeholder, land owner meetings and stakeholder workshops. Based on previous feedback from the public, open houses were not held during seeding and harvest periods. Comment sheets were distributed at each open house and made available online. Stakeholder meetings and workshops were convened with one or more stakeholder groups at the request of the stakeholder group. Workshops involved a presentation by Manitoba Hydro staff regarding the Project, routing and evaluation, whereas stakeholder meetings were more general in nature. Locations for open houses were chosen to require no more than 30 minutes of travel time. Manitoba Hydro personnel used iPads (mapping stations) to record information and concerns relayed at the open houses and stakeholder meetings, such as denoting sensitive sites, tower location preferences, and route preferences on maps of the route planning area. Notifications for each round of engagement were made via letters to potentially affected landowners, posters, postcards to residents in the route planning area, press releases, newspaper notices, radio spots, social media and Manitoba Hydro's Project webpage. Details regarding each round of engagement are noted below.

Round One

The first round of engagement held from September of 2013 through April of 2014 introduced the Project, including its description and purpose, provided an opportunity for questions and the documenting of concerns. A total of 59 alternative routes were presented terminating at three alternative points on the Manitoba-Minnesota border. Engagement consisted of 11 public open houses, 22 stakeholder meetings/workshops and 76 telephone/email exchanges. Feedback received during Round One of the PEP assisted in determining issues to be addressed in the environmental assessment, developing criteria for the evaluation of the alternative routes within preferred corridors and the determination of a preferred border crossing point. One of the open houses during Round One was held in Glenboro, Manitoba to outline expansion plans for Glenboro Station. The four potentially affected landowners were contacted and provided with information as well as an invitation to meet with Manitoba Hydro staff. Manitoba Hydro met with one potentially affected landowner at their home to discuss potential tower placement on their property.

Round Two

The second round of engagement occurred during April through August of 2014 and focused on: (i) criteria for selection and the identification of a preferred route from a set of 12 alternatives; and (ii) environmental assessment, particularly socio-economic considerations. Engagement activities consisted of 11 open houses, 25 stakeholder meetings, 5 landowner meetings and 322 email/telephone exchanges.

Border Crossing Modification Round

Following the completion of Round Two, discussions between Manitoba Hydro and Minnesota regarding mutually feasible border crossing points led to a change in Manitoba Hydro's proposed border crossing point. Accordingly, Manitoba Hydro undertook an additional round of engagement in November of 2014 to present the modified border crossing point and new alternative route segments connecting to this point. Engagement activities consisted of one public open house, one landowner meeting and one stakeholder meeting. Due to the localized nature of this change, Manitoba Hydro focused its engagement activities on the area surrounding the proposed border crossing point (Piney, Manitoba).

Round Three

The final round of the pre-regulatory PEP was held from January through September 21, 2015. During this round Manitoba Hydro presented the feedback from Round Two and the determination of a preferred route. Participants were provided with opportunities to identify further constraints or adjustments. Potential effects of the Project and possible mitigation measures were also canvassed. For this round, affected landowners (located along the route of the IPL) were identified using the tax roll and were notified by letter sent via express Canada Post. A signature was required to confirm receipt of the letter. Letters were also sent, via regular mail, to landowners within one mile of the proposed route of the IPL.

The Round Three engagement consisted of 10 public open houses, 16 landowner information centres, 7 landowner meetings, 20 stakeholder meetings and 421 telephone/email exchanges. Landonwer forms were developed to capture localized information from landowners within one mile of the preferred route. These forms were designed to be completed jointly by Manitoba Hydro personnel and the landowner in order to provide detailed information regarding these parcels of land for environmental assessment (ex:

weeds, fur-bearing animals). Completion of 106 of these forms was done at open houses, meetings and over the telephone.

6.3 Information Provided to Participants

As summarized in section 4 of this Project Description, Manitoba Hydro used an extensive array of information materials for the PEP using various different media. Accordingly, a single "information package" for the Project cannot be provided to the Board. A detailed list of the materials used in the PEP can be found in Table 3-2 of chapter 3 of the EIS.

6.4 PEP Feedback and Outcomes

The main concerns raised by PEP participants related to potential impacts to property and health. Concerns and preferences came mainly from those in close proximity to the proposed alternative routes. The predominant routing preference from PEP participants was to use unoccupied Crown lands in order to avoid agricultural or residential areas and privately held landholdings. Public engagement participants noted that the effects to agricultural areas included the economic value of these areas, and challenges in working around the tower structures (e.g., aerial spraying). Participants in rural residential areas expressed concerns regarding potential increases in the number of hunters and off road vehicles that would access the ROW and trespass onto private property. Another general preference regarding siting of the IPL that emerged from participants in the PEP was to follow existing transmission lines.

More specific feedback from the PEP that related to the route of the IPL was collected and then classified by individually numbered route segments for consideration in determining the proposed route. Analysis of the concerns took into consideration the number of concerns raised for the particular segment and the impact of any potential mitigation to address the concern. As a result of these analyses, numerous "mitigative segments" were developed. The mitigative segments were then evaluated by members of Manitoba Hydro's Project team to determine feasible alternative routes for presentation at the next round of the PEP and for inclusion in the final preferred route. Examples of the numerous mitigative segments that were developed in response to concerns raised during the PEP can be found in Chapter 3 of the EIS.

Given the diversity of participants involved in the PEP and FNMEP, feedback from these two engagement processes resulted in two competing preferences for siting the IPL: the preference to avoid use of private land so as to minimize impacts to farmlands and residences and the preference to avoid use of Crown land so as to minimize impacts to natural habitat. The models and related criteria used in Manitoba Hydro's route evaluation process incorporated these competing objectives and helped guide the selection of a proposed route that aimed to balance these concerns.

Information collected from affected landowners through the PEP will be used, where possible, to locate towers along the proposed route of the IPL so as to minimize impacts on agriculture and residential areas. The feedback gained from the PEP was also instrumental in the environmental assessment process. The PEP resulted in the incorporation of additional information on future land development for Manitoba Hydro's consideration, the identification of sensitive sites and the development of various mitigation measures. Mitigation measures included environmental protection plans, construction scheduling aimed at minimizing impacts on wildlife, the selection of tower type and placement to minimize impacts on agricultural and livestock operations, and the use of roads and cut lines as access routes

during construction to limit the potential for an increase in unauthorized access to private lands and hunting areas.

Outcomes related to the design of the PEP include the addition of stakeholder group participants to the Master Stakeholder List, the inclusion of additional engagement activities such as meetings with stakeholders groups and landowners at their request, additional open houses, and the development of additional information materials (e.g., handout for “MMTP and Ridgeland Cemetery”).

7 Potential Environmental and Socioeconomic Interactions and Effects

7.1 General

This section provides a summary of the key anticipated environmental and socioeconomic interactions and effects of the Project. A detailed assessment is provided in chapters 8 through 24 of the EIS. As noted in the EIS (Section 24.6), after considering Project residual effects, and the overlap with past, present and future projects (i.e., the cumulative effects of the Project), Manitoba Hydro concluded that the Project will not result in significant adverse effects to the biophysical or socioeconomic environment.

This section summarizes the following topics:

- Atmospheric and Acoustic Environment;
- Water Environment (including fisheries and species at risk):
- Land Environment (including vegetation, wildlife and species at risk); and
- Socioeconomic Environment (including heritage resources, First Nations and Métis).

7.2 Atmospheric and Acoustic Environment

7.2.1 General

The Project is located in southern Manitoba, which has a climate characterized by short, warm summers and long, cold winters. Winds are frequent and often strong (Smith et al. 1998). The climate is characterized by regional influences that include day to night temperature fluctuations, localized storms, large weather systems and the potential occurrence of tornadoes in the summer. The average annual temperature ranges from 2.7°C at Sprague to 3.2°C at Piney and 3.5°C at Cypress River in the Glenboro area. There is little variability in average monthly temperature across the Project region. The extreme minimum is below -40°C and the extreme maximum is above 35°C.Total precipitation varies throughout the Project region from an annual average total of 521 mm at Winnipeg to 637 mm at Sprague. Precipitation falling in the summer represents 47% of annual precipitation in Winnipeg. The average annual total precipitation was 527 mm at Cypress River in the Glenboro area for Glenboro South Station. The average annual wind speed ranges from 14.9 km/h at Brandon to 17.1 km/h at Winnipeg. Wind at Winnipeg most frequently blows from the south while wind at Brandon most frequently blows from the west or northeast. Gust speeds exceeding 90 km/h have been recorded in both Winnipeg and Brandon in all months. The maximum observed gust speeds range from 129 km/h at Winnipeg to 139 km/h at Brandon.

7.2.2 Changes as a Result of the Project

The following is a summary of preliminary potential interactions and effects of the Project on the atmospheric and acoustic environment. Mitigation measures for atmospheric and acoustic effects are summarized in the Socioeconomic Environment section of this Project Description.

- Air Emissions:
    - Air emissions will derive from stationary and mobile point sources and fugitive sources, with fugitive sources likely to contribute the majority of the air emissions.
    - During construction the Project is expected to generate air emissions as a result of vehicular and construction equipment traffic, construction activities such as excavation and placement of materials, and site clearing activities.
    - Emissions will generally consist of dust (particulate loadings) from traffic and construction activities, and NOx, SO_2, CO and particulate matter emissions generated from internal combustion gasoline and diesel engines and burning cleared trees and vegetation. During normal operations, emission loadings will be limited to NOx, SO_2, CO and particulate matter from point sources including vehicles and equipment.
    - There are also risks of emissions from high voltage electrical apparatus such as circuit breakers and bushings, which typically use Sulphur Hexafluoride (SF_6) as an internal insulating medium between energized and non-energized components. A blend of SF_6 and Carbon Tetraflouride (CF_4) or Nitrogen (N_2) gas is typically utilized to prevent condensation of the SF6 gas within the apparatus and maintain adequate electrical insulation at ambient temperatures as low as -50°C.
- Greenhouse Gas Emissions:
    - The main greenhouse gas emissions during the construction phase result from manufacturing of building materials, transportation of the materials and components to site, onsite construction activit$_i$es resulting from diesel combustion in construction equipment, burning of cleared vegetation and land use change.
- Noise Emissions:
    - Construction noise will primarily be associated with clearing, earthmoving and materials handling equipment. Audible noise levels arising from station equipment operation will be subject to final design and equipment selection.
- Electric and Magnetic Fields and Corona:
    - Operation of the Dorsey IPL will involve the production of electric and magnetic fields (EMF) and corona discharges. The level of these will vary with time, subject to operating mode and loading conditions and, as well, to final station design and equipment selection, and such external considerations as meteorological conditions.
    - Concerns respecting potential environmental effects (e.g., health effects, electrostatic and electromagnetic induction effects, etc.) arising from EMF and corona emissions were raised in the course of the public engagement program for the Project. Electric and magnetic field levels were calculated at the edge of the ROW and on the ROW for all sections of the Dorsey IPL (see Tables 18-10 and 18-11 of chapter 18 of the EIS). The highest electric and magnetic field levels do not exceed the limits recommended by national and international agencies, as detailed in section 18.5.5 of the EIS.

- Discharges and Wastes:
    - Sources of potential liquid discharges would primarily relate to construction activities in the vicinity of watercourses, where loss of ground cover and changes in drainage could cause erosion and result in suspended sediments entering the water. Liquid discharges could also result from accidental leaks or spills of fuel or oil from vehicles and equipment. This could include insulating oil used in power transformers and other high voltage electrical apparatus as an electrical insulator and heat transfer medium. Manitoba Hydro will implement measures to prevent and manage these issues through an Environmental Protection Program, described in the EIS.
    - Domestic wastes produced at the Project site are likely to include food scraps, refuse, clothing, metal tins, scrap metal, glass, plastic, wood and paper. Recycling programs will be instituted where feasible. Food refuse, as well as other wastes destined for the waste disposal site, will be stored temporarily in approved containers maintained in a secure location to prevent intrusion by wildlife. Non-hazardous wastes produced during both the Project operations and construction phases, will be trucked off site to a licensed landfill. A burn area may be established at the Project site subject to environmental approvals for seasonal open air burning of clean wood packaging and similar materials that are not returned to the vendor or reused, to help preserve landfill capacity.
    - Wastes requiring special management are expected during construction and operation of the Project including oils, lubricants, refrigerants, solvents, paints, batteries, and explosives. Hazardous materials will be transported by qualified carriers and managed according to *The Dangerous Goods Handling and Transportation Act*. An oil containment system will be designed to address risks of contamination to adjacent areas and waterways. All used oil products (including empty containers and filters) and other hazardous wastes will be collected and disposed of in approved storage containers. All used oils and hazardous wastes will be removed from the site for recycling or disposal at a licensed facility.
    - An inventory of materials shipped for recycling and/or disposal will be maintained and a receipt of materials from the licensed facility will be recorded. Explosives will be stored, transported and handled in accordance with regulations in *The Workplace Safety and Health Act* and the *Explosives Act*.

7.3 Water Environment

7.3.1 Hydrology

The Project is located within the Nelson River Drainage Basin of the Hudson Bay Basin, specifically the Lake Winnipeg watershed (Map 14 – Watersheds and Sub-Watersheds, Appendix B). The Project traverses two major basins, the Assiniboine River and Red River basins (Map 15 – Stream Crossings, Appendix B). The Glenboro South Station Project component is located within the Assiniboine River watershed, Brandon Division (Smith *et al.* 1998). The Project extends across one sub-watershed within the Assiniboine River Basin, the Lower Assiniboine River (05MJ) sub-watershed and six sub-watersheds of the Red River Basin including: the La Salle (05OG), Red River (05OC), Seine River (05OH), Cooks

Creek/Devils Creek (05OJ), Rat River (05OE) and the Roseau River (05OD) sub-watersheds. The Project region consists of 78 watercourses, including rivers, streams, creeks and agricultural drains. The main watercourses of interest in the Project region from north to south are Sturgeon Creek, Assiniboine River, La Salle River, Red River, Red River Floodway, Cooks Creek, Edie Creek, Fish Creek, Seine River, La Broquerie Drain, Rat River and Pine Creek. These watercourses are categorized as being large permanent, intermittent, or small permanent waterbodies.

7.3.2 Hydrogeology

Aquifers can be found in the sand and gravel lenses located above the carbonate bedrock throughout the Project region (Betcher *et al.* 1995). There are major buried sand and gravel aquifers located in areas of the RMs of Springfield, Ste. Anne, La Broquerie, Stuartburn and Piney (see Map 16 – Flowing Wells and Springs, Appendix B). Groundwater quality in the aquifers ranges from poor to excellent. Depth to these aquifers ranges from a few metres to more than 100 m (Rutulis 1987).

7.3.3 Fisheries Resources

7.3.3.1 General

Major watercourses crossed in the Project region include the Assiniboine, Red, La Salle, Seine and Rat rivers (Map 15 – Stream Crossings, Appendix B). The aquatic species found in these waterbodies support a commercial, recreational and Aboriginal fishery in the Project region. Common aquatic species in these waterbodies are: black bullhead (*Ameiurus melas*), black crappie (*Poxmoxis nigromaculatus*), brook trout (*Salvenlinus fontainalis*), brown bullhead (*Ameiurus nebulosus*), brown trout (*Salmo trutta*), Burbot (*Lotal lota*), Channel catfish (*Ictalurus punctatus*), Cisco (*Coregonus artedi*), Common carp (*Cyprinus carpo*), freshwater drum (*Aplodinotus grunniens*), golden redhorse (*Moxostoma erythrurum*), goldeye (*Hiodon alosoides*), lake whitefish (*Coregonus clupeaformis*), largemouth bass *(Micropterus salmoides*), northern pike (*Esox lucius),* quillback (*Caripiodes cyprinus*), rock bass (*Ambloplites rupestris*), Sauger (*Sander canadensis*), shorthead redhorse (*Moxostoma macrolepidotum*), silver redhorse (*Moxostama anisurum)*, smallmouth bass (*Micropterus dolomieu*), walleye (*Sander vitreus*), white sucker (*Catostomus commersoni*), and yellow perch (*Perca flavescens*).

The major watercourse near the Glenboro South Station Project component is the Assiniboine River, located approximately 7 km northwest of the site. Rainbow, brown, brook, lake trout and lake sturgeon have been stocked and/or reintroduced in some water bodies within this basin (North/South Consultants Inc. 2010).

7.3.3.2 Species at Risk

There are 12 fish species and one aquatic invertebrate that have the potential to inhabit the watercourses in the Project region that are listed under the federal *Species at Risk Act* (SARA), the Committee on the Status of Endangered Species in Canada (COSEWIC) and in Manitoba, *The Endangered Species and Ecosystems Act* (MESEA). The species and their status are as follows:

- bigmouth buffalo (*Ictiobus chyprinellus*) *– special concern (SARA, COSEWIC)*
- carmine shiner *(Notropis percombromus) – threatened (SARA, COSEWIC)* and vulnerable (*MESEA*).
- lake sturgeon *(Acipenser fulvescens) – endangered (COSEWIC, SARA under consideration)*

- mapleleaf mussel (*Quadrula quadrula*) – *threatened (SARA, COSEWIC) and endangered (MESEA)*
- northern brook lamprey (*Ichthyomyzon fossor) – special concern (SARA)*
- shortjaw cisco *(Coregonus zenithicus)* – threatened (*SARA Schedule 2, COSEWIC*)
- silver chub (*Macrhybopsis storeriana*) – *special concern (*SARA)

7.3.4 Changes as a Result of the Project

The following is a summary of potential adverse effects to the water environment and key mitigation measures:

- Potential effects:
    - Change in water quality and fish habitat.
    - Change in fish mortality/health.
- Key mitigation measures:
    - Within 30 m of watercourse crossings, removal of riparian vegetation in the ROW will be limited to select plants required to accommodate overhead lines, and uprooting of plants will be limited.
    - Shrub and herbaceous understory vegetation along with tree root systems will be retained to the greatest extent possible in order to enhance bank stability.
    - Riparian buffers will be re-established, and vegetation will be allowed to regenerate naturally (with the exception of trees that could exceed guidelines and encounter the transmission lines).
    - Standard mitigation practices developled by Manitoba Hydro on similar projects will be used regarding activities such as herbicide application and the use of machinery near watercourses.
    - Construction activities surrounding watercourses will take place within timing windows to avoid sensitive periods such as spawning.
    - Implementation of a no fishing policy for construction and maintenance personnel on the Project, and where necessary, machine free zones will be established.

7.4 Land Environment

7.4.1 Physiography and Soils

7.4.1.1 Physiography

The surficial geology and terrain in the Project region is the result of the Pleistocene glaciation modified by post-glacial processes. The majority of surficial materials are glaciolacustrine sands, silts and clays from Glacial Lake Agassiz overlying till. In the Project region, the landform is dominantly a level to gently sloping lacustrine plain with elevations ranging from 221 metres above sea level (masl) to 396 masl in the southeast.

The Existing Corridor ROW, Dorsey Converter Station and Riel Converter Station are located within a smooth, level to gently sloping landscape comprised of clay and silts with slopes ranging from level to less than two percent (Hopkins 1985, Smith *et al.* 1998). The mean elevation is 236 masl. The New Corridor ROW originates in the same glaciolacustrine plain as the Existing Corridor ROW; however, it transitions to an area of gently undulating water-worked moraines with thin and discontinuous veneers and blankets of sandy to clayey glaciolacustrine sediments (Smith *et al.* 1998). The moraines consist of a cobble and gravel loam till. Sandy to gravelly beach materials and bouldery near-shore materials are also present. Slopes range from level to five percent. The mean elevation is 297 masl. Moving south and southeastward along the New Corridor ROW into the RMs of La Broquerie, Stuartburn and Piney, the Project region has a more complex surficial geology. As reported by (Mills *et al.* 1977), the area consists of gently undulating ground moraine composed of medium-textured calcareous till, coarse-textured outwash and beach ridge deposits, undulating to hummocky terrain with some dunes composed of thin, coarse- to fine-textured lacustrine and deltaic deposits overlying till, and large, level to depressional areas of poorly drained organic deposits.

The Glenboro South Station is located within a level to hummocky pro-glacial lacustrine plain with slopes ranging between level and 15 percent. Surficial deposits and landforms in the area range from kettled to gently undulating loamy till, to level to gently undulating sandy glaciofluvial and glaciolacustrine deposits. The level to hummocky physiography is a major part of the Assiniboine Delta (Smith *et al.* 1998). The mean elevation is 366 masl.

The predominantly flat to very gently sloping topography found in the Project region results in a low likelihood for mass movement processes.

7.4.1.2 Soils

The dominant soils in the Project region are of the Vertisolic, Chernozemic, Gleysolic, Organic, Luvisolic and Brunisolic orders. In general, the soils have developed on glaciolacustrine deposits from Glacial Lake Agassiz deposited over the till in moraines from the last glaciation (Smith *et al.* 1998).

The soils within the Existing Corridor ROW and at Dorsey and Riel are dominantly imperfectly drained Gleyed Humic Vertisols and Gleyed Vertic Black Chernozems, with areas of poorly drained Gleysolic Humic Vertisols and Humic Gleysols (Smith *et al.* 1998). These soils were formed in the clayey glaciolacustrine deposits of Glacial Lake Agassiz. Gleyed Rego Black Chernozems and other Gleysolic soils have also developed on calcareous loamy to silty sediments from the latter stages of the lake.

Along the northern portions of New Corridor ROW, soils are predominantly well and imperfectly drained Dark Gray Chernozems developed on thin, discontinuous sandy to loamy glaciolacustrine veneers over till. Well-drained Luvisolic soils occur on the exposed moraine ridges with imperfectly drained Luvisols and Brunisols occurring in the sandy deposits. Soils occupying the lowlands are poorly drained peaty Gleysols and very poorly drained Organic soils.

Towards the south and southeast portions of the New Corridor ROW soils are complex and have developed on a variety of materials and under a range of drainage conditions. Lowland areas are dominated by poorly drained peaty Gleysols and very poorly drained Mesisols developed on sedge peat. Dark Gray Chernozems, Eutric Brunisols and Gray Luvisols are common in the sandy to loamy veneers

overlying till and moraine ridges, while Dystric Brunisols are found on the weakly to non-calcareous glaciofluvial, till and eolian deposits.

Soils within the vicinity of the Glenboro South Station belong to the Chernozemic and Gleysolic orders. Both Chernozems and Gleysols have developed on the strongly calcareous, fine loamy sediments that dominate the area. Surface texture within the station is primarily fine and loamy.

7.4.2 Vegetation

7.4.2.1 General

Map 17 (Appendix B) shows the Dorsey IPL route and various ecoregions and ecozones that would be crossed. The Project region is located in southern Manitoba in the Prairies Ecozone, Boreal Plains Ecozone and Boreal Shield Ecozone. The three terrestrial ecozones in the Project region are divided into four terrestrial ecoregions (Smith *et al.* 1998). The Existing Corridor ROW is primarily located in the Lake Manitoba Plain Ecoregion of the Prairies Ecozone. The northern portion of the New Corridor ROW is located in the Interlake Plain Ecoregion of the Boreal Plain Ecozone, with the southernmost portion of the New ROW located in the Lake of the Woods Ecoregion of the Boreal Shield Ecozone. The Glenboro South Station Project component is located in the Aspen Parkland Ecoregion of the Prairies Ecozone.

The Project crosses many types of land cover classifications, varying from cultivated, pasture, native grasslands and shrubland to deciduous forests, mixedwood forests, coniferous forests and varying types of wetlands (Map 18 – Wildlife Habitat in the Eastern Project Region and Map 7-6 Wildlife Habitat in the Western Project Region, in Appendix B). Agriculture (pastures and cultivated) is the most common land cover class in the Project region. As the Project moves eastward, it shifts from cultivated land to pasture and hayland with most of the forested landscape in the southeastern portion of the Project region.

7.4.2.2 Species at Risk

During the Project field surveys, no plant species were found that are listed under SARA, COSEWIC or MESEA. None have been recorded historically or have designated critical habitat within the Project footprint or local area. With the exception of riparian areas, there is little potential for species at risk or of concern to occur along the Existing Corridor ROW and at station locations because these areas are dominated by agricultural lands. There is greater potential for species at risk or of conservation concern to occur along the New Corridor ROW because most of this portion of the route is comprised of native vegetation and wetlands.

7.4.3 Wildlife

7.4.3.1 Mammals

Mammals in the Project region include ungulates, furbearers, bats and other small mammals. White-tailed deer (*Odocoileus virginianus)* are widespread and use a variety of habitats, including pasture, cropland, wetland margins and woodlands. American elk (*Cervus canadensis*) have a more limited distribution, with a single herd occurring primarily in the Vita / Arbakka area, but also ranging south into Kittson County, Minnesota (Franke 2014, pers. comm.). The elk use forested areas for cover, although they forage in grasslands, cropland fields and traverse the periphery of wetlands. Although moose (*Alces alces*) were historically more common, they have become rare in the Project region due to a combination of factors such as hunting, predation and disease (*e.g.*, brainworm [MCWS 2014]). They are only occasionally

encountered in forests or wetlands. Large furbearers associated with woodland habitat are black bear (*Ursus americanus*), gray wolf (*Canis lupus*) and bobcat (*Lynx rufus*). Coyote (*Canis latrans*) typically occur in areas that are more open. Small furbearers in the Project region include American marten (*Martes americana)*, red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*) and beaver (*Castor canadensis*). These species are typically associated with wooded areas but also make use of adjacent open habitat. Similarly, bats (*e.g.*, little brown myotis [*Myotis lucifugus]* and long-eared myotis [*Myotis septentrionalis])* roost in forests but hunt in nearby fields or wetlands. Other small mammals common in the Project region include eastern cottontail (*Sylvilagus floridanus*), snowshoe hare (*Lepus americanus*), deer mouse *(Peromyscus maniculatus*) and southern red-backed vole (*Clethrionomys gapperi*).

7.4.3.2 Birds

At least 51 species of waterbirds (swans, geese, ducks, loons, grebes, pelicans, cormorants, herons, rails, shorebirds, gulls and terns) have been observed in the Project region. Although some of these species breed within the Project region, most are transient and move through during the migration periods. Among the most common species are Canada goose (*Branta Canadensis*), snow goose (*Chen caerulescens),* tundra swan (*Cygnus columbianus*), ring-billed gull (*Larus delawarensis)*, sandhill crane (*Grus canadensis*) and killdeer (*Charadrius vociferous*). Waterbirds are primarily associated with large open wetlands. They also occur along streams and at small ponds and wetlands with limited areas of open water. Important staging sites for migrating waterbirds in spring and fall include Lonesand, Sundown Lake, Richer Lake, Deacon's Reservoir, the Red River and the Assiniboine River (see Maps 18 and 19, Appendix B).

At least 26 raptors (vultures, eagles, hawks, falcons, owls) have been observed in the Project region, although a few are observed only during migration (*e.g.*, golden eagle) or over winter (*e.g.*, rough-legged hawk [*Buteo lagopus*], gyrfalcon [*Falco rusticolus*], and snowy owl [*Bubo scandiacus*]). Peregrine falcon (*Falco peregrinus*) move through the Project region during migration and are known to nest in downtown Winnipeg (atop skyscrapers) (Wheeldon 2003). Young peregrine falcons are also reared and released from the Parkland Mews captive breeding centre near St. Norbert (Wheeldon 2003). Most species that breed in the Project region typically nest in forested habitat and hunt in adjacent open areas. Northern harrier (*Circus cyaneus*) and short-eared owl (*Asio flammeus*) differ in that they are limited to nesting and hunting in open habitat. Osprey (*Pandion haliaetus*) is also specialized, favouring fish-bearing lakes and streams.

At least 117 songbird species occur in the Project region, with diversity peaking during spring, fall migration and during breeding season (approximately May to July [MB BBA 2010]). Relatively few species remain over winter. Many songbird species occur in wooded areas, including species that favour mature forest interiors (*e.g.*, ovenbird) and those that thrive along edges (*e.g.*, golden-winged warbler [*Vermivora chrysoptera]*). A number of songbirds are associated primarily with wetland habitat and may occur there in large numbers (*e.g.*, yellow warbler [*Dendroica petechial],* common yellowthroat [*Geothlypis trichas]*, red-winged blackbird [*Agelaius phoeniceus]*). Several species are widespread and common in upland open habitat, some are more associated with native grassland or pasture (*e.g.*, bobolink [*Dolichonyx oryzivorus*]) and others are common in cropland (*e.g.*, horned lark [*Eremophila alpestris]*).

Other birds in the Project region include upland gamebirds, doves, nightjars, swifts and woodpeckers. Native upland gamebirds in the Project region are primarily ruffed grouse (*Bonasa umbellus)* found in deciduous and mixedwood forests and sharp-tailed grouse (*Tympanuchus phasianellus)* found primarily in native grassland and pasture and the introduced gray partridge (*Perdix perdix*) occurs in open areas and cropland. The native mourning dove (*Zenaida macroura),* the non-native rock pigeon (*Columba livia)* and Eurasian collared-dove (*Streptopelia decaocto*) all occur in open areas. Two species of nightjar (eastern whip-poor-will [*Antrostomus vociferous]* and common nighthawk [*Chordeiles minor]*) nest in wooded habitat but forage nocturnally over adjacent open areas. Chimney swift (*Chaetura pelagica*) is associated primarily with urban habitat. Four woodpecker species are year-round residents in the Project region, while another three occur during the breeding season. All are primarily associated with wooded areas, although some species, such as red-headed woodpecker (*Melanerpes erythrocepalus)* and northern flicker (*Colaptes auratus*), favour open forests and edges.

7.4.3.3 Amphibians and Reptiles

Most of the thirteen amphibian species occurring in the Project region are frogs and toads, with common species including boreal chorus frog (*Pseudacris maculate*), wood frog (*Rana sylvatica*) and northern leopard frog (*Lithobates pipiens*). They tend to breed in wetlands (including lakes, ponds, rivers, creeks and roadside ditches), although most species spend time in adjacent upland communities. In contrast, mudpuppies are entirely aquatic and are therefore restricted to suitable habitat, generally favouring streams and ponds with submerged rocks or logs for cover (Manitoba Herps Atlas 2015).

The nine reptile species in the Project region include one lizard, two turtles and five snakes. The western painted turtle (*Chrysemys picta belli)*, snapping turtle (*Chelydra serpentine)*, red-sided garter snake (*Thamnophis sirtalis parietalis)* and western plains garter snake (*Thamnophis radix*) are primarily found near wetlands and riparian habitat. The red-bellied snake (*Storeria occipitomaculata*) and smooth green snake (*Opheodrys vernalis)* are more associated with upland open habitat, such as edges of wooded areas, in fields, meadows and abandoned farms. The western hognose snake *(Heterodon nasicus)* and the northern prairie skink (*Plestiodon septentrionalis*) have narrow ranges within Spruce Woods Provincial Park located approximately 8 km northeast of the Glenboro South Station. Western hognose snake are found in the sandy grasslands and open woodlands of the park while the prairie skink is limited to areas of mixed-grass prairie in sandy soils (Manitoba Herps Atlas 2015).

7.4.3.4 Species at Risk

Wildlife species at risk include those that are listed under the *Species At Risk Act* (SARA) or *The Endangered Species and Ecosystems Act* (Manitoba) (MESEA), or have been recommended by COSEWIC for listing under SARA.

Grey Fox (*Urocyon cinereoargenteus)* is listed as *threatened* under Schedule 1 of SARA. This furbearer has been found in deciduous forest and scrub habitat located in the southeastern part of the Province, for example near Sprague, MB (Berezanski pers. comm. 2015). Although there are no documented occurrences of American badger (listed as *special concern* by COSEWIC) in the Project region, they have the potential to occur in areas that support open field and grassland habitat, including along roads, shelterbelts, field edges and hedgerows (COSEWIC 2012). The two bat species listed as *endangered* under SARA are the little brown myotis and long-eared myotis*.* Both have the potential to occur within the Project region (Government of Canada 2014).

Eleven bird species are listed by MESEA and SARA. Three bird species are listed only under SARA; the yellow rail (*special concern*), olive-sided flycatcher (*threatened*) and rusty blackbird (*special concern*). The trumpeter swan (*Cygnus buccinators*; *endangered*) is listed only under MESEA. Another five species have been recommended by COSEWIC for listing under SARA, the horned grebe (*Podiceps auritus; special concern*), eastern wood-pewee (*Contopus virens; special concern*), bank swallow (*Riparia riparia; threatened*), barn swallow (*Hirundo rustica; threatened*) and bobolink (*threatened*). Two of the 22 bird SOCC are ranked as rare by the MB CDC, the pine warbler (*Setophaga pinus)* and grasshopper sparrow (*Ammodramus savannarum)*.

The northern leopard frog, the only amphibian species of conservation concern in the Project region, is listed under SARA as *special concern*. The snapping turtle (listed as *special concern* under SARA) and prairie skink (*endangered* under SARA and MESEA) are the only reptile species of conservation concern to occur in the Project region.

7.4.4 Changes as a Result of the Project

The majority of potential interactions and effects of the Project on wildlife and wildlife habitat were mitigated during the planning and routing process by paralleling the Dorsey IPL with portions of existing transmission lines, avoiding sensitive wildlife habitat and movement areas, including protected areas and large tracts of intact forests and wetlands.

The following is a summary of anticipated adverse effects to the land environment resulting from the Project:

- Potential effects:
    - Change in vegetation landscape intactness.
    - Change in native vegetation/wetland cover class, abundance and distribution structure and function.
    - Change in invasive species abundance and distribution.
    - Change in rare/traditional use plant secies abundance and distribution.
    - Change in wildlife habitat availability.
    - Change in wildlife mortality risk.
- Key mitigation measures:
    - Transmission line routing took into consideration areas of large intact native vegetation patches; particularly any areas of tall grass prairie, protected areas or areas designated as being important.
    - Scheduling activities in sensitive areas such as wetlands to occur under frozen ground conditions.
    - Applying buffers and setbacks during clearing activities for species at risk, and to riparian habitats in which shrub and herbaceous vegetation will be retained.
    - Establishing machine-free zones where necessary, where only low disturbance clearing methods are permitted.

- Project equipment will be cleaned prior to coming to the worksite to remove any vegetative material and to reduce the risk of spreading noxious and invasive plant seeds.
- During operation, vegetation will be allowed to regenerate along parts of the ROW, providing habitat for some wildlife species.
- Changes in mortality risk to wildlife were reduced by avoiding protected areas, proposed ecological sites and areas of natural wildlife habitat through Project routing - the majority of the proposed route traverses modified low quality wildlife habitat such as agricultural lands.
- Pre-construction surveys will be undertaken to identify important sites such as stick nests and mineral licks to identify areas for setbacks and buffers.
- Scheduling of Project activities will take into account periods of the year when wildlife species are within a sensitive lifecycle activity such as calving, nesting, and hibernation.
- Bird flight diverters used on skywires in areas that concentrate birds is planned to reduce wildlife mortality risks.

7.5 Socioeconomic Environment

7.5.1 General

The Project is located in southern Manitoba (Map 1, Appendix B). Winnipeg, the largest metropolitan area in the province and its capital, is home to about 60% of the province's population. Brandon, located approximately one hour by car from the Glenboro South Station, is Manitoba's second largest metropolitan area. Both Winnipeg and Brandon provide a full range of infrastructure and services and are major economic and employment centres in the province. The Town of Ste. Anne is a smaller community located in the Project region. The City of Steinbach is located adjacent to the Project region that may be used for labour, infrastructure and services. The Village of Glenboro is located north of Glenboro South Station.

Map 20 (Appendix B) displays the First Nation information for the Project region. First Nation communities located within Treaty 1 Territory or with interest in the Project region include the Brokenhead Ojibway First Nation, Long Plain First Nation, Peguis First Nation, Roseau River Anishinabe First Nation, Sagkeeng First Nation (Fort Alexander), Sandy Bay Ojibway First Nation and Swan Lake First Nation. Buffalo Point First Nation is a signatory to Treaty 3 and is included due to its proximity to the Project region. Black River First Naiton is a signatory to Treaty 3 and is included based on their interest in the Project. There is also Metis population within communities in the Project region, and Map 21 (Appendix B) shows the Metis natural resource harvesting areas. Outside of these communities, the Dorsey IPL traverses various RMs, which encompass some small communities and other rural land uses.

Agriculture is the dominant land use within the Project region Map 22 (Appendix B) displays an index map of agricultural land use. Additional maps can be found in Chapter 15 of the EIS. Other economic activities include mining (quarrying, aggregate, mineral peat) and forestry (limited sawlog and pulpwood). Hunting and trapping are ongoing activities. Recreation and tourism, including camping, fishing and boating are important activities centred on use of provincial parks and provincial forestlands, other designated lands and water-oriented recreation areas.

Map 23 (Appendix B) displays an index map of heritage sites in the Project region. Additional maps can be found in Chapter 12 of the EIS. As the majority of the Project region has been under agricultural land use for the past 130 years this has altered the horizontal and vertical context of artifacts within archaeological sites. Several areas south of Zhoda, Manitoba have not been developed and remain under native vegetation. There are no previously recorded heritage resources in or adjacent to the Dorsey Converter Station, the Riel Converter Station or the Glenboro South Station.

The provincial inventory of Provincial and Municipal sites lists seven designated sites within the Project region, consisting of six churches and a bridge. None of these sites are within the development area of the proposed route. The provincial inventory of previously recorded archaeological sites within the Project region contains 59 sites. The majority of the sites were altered by cultivation and/or erosion and most of the sites were recorded based on artifacts found on the surface of agricultural fields. One site is located within the New Corridor ROW and consists of an isolated artifact found in an area of modified pastureland. The site indicates past human activity from an undated period but the vertical and horizontal locations of any additional artifacts, if present, have been altered by cultivation. The altered artifact locations have reduced the importance of this site and its presence within the proposed route would not affect construction and operation of the transmission line. Two archaeological sites have been previously recorded within the Existing Corridor ROW and both relate to farmsteads that were occupied by former Hudson's Bay Company employees between the mid-1850s and the early 1900s. Both sites are along the west edge of the Existing Corridor ROW and would not be disturbed by proposed construction and operation.

The provincial inventory of Centennial farms (*i.e.*, farmstead that have remained with the same family for more than 100 years) contains 15 sites. There are no centennial farm sites within the New Corridor ROW or within the Existing Corridor ROW. There are 27 former school sites within the Project region and all school buildings have been demolished. None of the school sites are intersected by the final preferred route of the New Corridor ROW and no sites are within the Existing Corridor ROW.

Sixty-eight cemeteries were identified within the Project region. No cemeteries were situated within the Existing Corridor ROW and the eastern boundary of the Ridgeland Cemetery north of Sundown Manitoba is within 100 m of the New Corridor ROW. This cemetery was assessed during the heritage resources impact assessment and there is a low potential for unmarked burials outside of the recognized east cemetery parameter.

7.5.2 Changes Expected as a Result of the Project

The following is a summary of anticipated adverse effects to the socioeconomic environment resulting from the Project:

- Infrastructure and services:
    - Potential effects:
        - Change in accommodations.
        - Change in community infrastructure and services.
        - Change in road traffic.
        - Interference with transportation and utility infrastructure.

- Interference with communication and radio signals.

- Key mitigation measures:
  - Manitoba Hydro will continue to engage with and share Project information with local governments, service providers, and/or businesses.
  - An Emergency Response Plan (ERP) will be developed. As part of the development and implementation of the ERP, MH will work with local emergency responders to maintain appropriate emergency response times.
  - Project personnel will be made aware of the ERP and designated staff will receive ERP training.
  - Emergency response equipment and trained personnel will be present at construction sites and camp(s).
  - Transmission line routing considered interference with existing transportation, utility and communication infrastructure to the extent possible.
  - Locations of marshalling yards and camps will be communicated to relevant RMs to advise of increased truck movements in the vicinity of the yards, the timing of activity, and the additional noise or light levels that could be expected from the site.
  - Group transportation (e.g., buses, crew vans) will be utilized to transport workers between camp(s) and the worksites, and between temporary accommodations in nearby communities and the worksites.
  - Manitoba Hydro will work with local authorities to address any damage to roads that occur as a result of the Project.

- Employment and Economy:
  - Potential effects:
    - Changes in local employment and labour.
    - Changes in purchases of goods and services.
    - Changes in GDP/government revenue.
  - Key mitigation measures:
    - As effects are expected to be positive, no mitigation measures are planned. It is expected that the Manitoba economy will benefit from approximately $101 million in direct construction spending, and 504 person-years of employment. Project purchasing will create employment, result in business opportunities through the purchase of goods and services, and generate local, provincial, and federal revenue.

- Agriculture
  - Potential effects:
    - Loss or degradation of agricultural land.

    - Conflict with agricultural activities.
  - Key mitigation measures:
    - Considered during the routing process, which included the routing of a substantive portion of the Project transmission line within existing transmission corridors.
    - Manitoba hydro used existing transmission line corridors for 43% of the line, which reduces the extent of permanent loss of agricultural land.
    - The use of self-supporting steel lattice towers in agricultural land to reduce the extent of permanent land loss.
    - The Manitoba Hydro Agricultural Biosecurity Policy will prevent the introduction and spread of disease, pests and invasive plant species in agricultural land and livestock operations.
    - Manitoba Hydro has provided opportunities to discuss and identify areas of concern and potential tower spotting preferences with potentially affected landowners.
    - Manitoba Hydro's land compensation policy for affected landowners for permanent and temporary loss of agricultural land.
- Land and Resource Use:
  - Potential effects:
    - Change in property values.
    - Change in forested areas (commercial forestland and high value forest sites).
    - Change in mining/aggregate extraction.
    - Change in commercial/recreational hunting and trapping.
  - Key mitigation measures:
    - The use of existing transmission corridors for routing of a large portion of the Dorsey IPL.
    - Notifying resource users as early as possible in the construction process regarding the schedule for clearing, construction, and operation and maintenance.
    - Using existing access roads and trails to the extent possible.
    - Maintaining a buffer of trees between a site/trail and the transmission line ROW in areas where site-specific issues of concern have been identified.
    - Implementing the Manitoba Hydro compensation policy for the purchase of privately-owned land required for the transmission line ROW, which offers landowners 150 percent of the current market value for the easement.
    - Hunting and harvesting of wildlife or possession of firearms by Project staff will not be permitted while working on Project sites.
- Community Health and Well-Being and Human Health:

- Potential effects:
  - Changes in visual quality.
  - Changes in health resulting from socio-economic change.
  - Employment and income opportunities generated by the Project.
  - Changes in health associated with mobile workforce.
  - Changes in levels of stress and annoyance.
  - Changes to Aboriginal health.
  - Changes in capacity of or demand on health care services and iInfrastructure
  - Changes to air quality.
  - Changes to country food quality.
  - Changes to noise levels.
  - Changes to electric and magnetic fields
- Key mitigation measures:
  - Proximity to potential human health receptors such as houses, schools, daycares, recreational centers, sites of worship such as churches, campgrounds, and picnic areas were considered in transmission line routing.
  - Measures to reduce the visual prominence of the Project include tower spotting to reduce visual interference where possible, the use of non-reflective galvanized materials and paralleling of existing transmission lines.
  - Manitoba Hydro will enter into easement agreements with private landowners whose land is crossed by the transmission line. The information provided to landowners during this process is expected to alleviate concerns related to Project uncertainty.
  - Continuing to address concerns related to EMF and providing factual, science-based information to concerned individuals and organizations.
  - Manitoba Hydro will consider non-chemical vegetation management in clearly identified sensitive sites that contain plants that are of importance to Aboriginal harvesters.
  - Project information, including workforce information and accommodation requirements, will be shared with local governments, service providers, and businesses, as appropriate, so they are aware of anticipated Project-related demands, allowing them to identify and address potential service gaps or issues.
  - Project personnel will be made aware of the Emergency Response Plan and designated staff will receive Emergency Response Plan training.

- An environmental protection plan includes standard mitigation measures to be followed to address aspects such as Project-related combustion and dust emissions, and the use of herbicides is well regulated.
- Measures will include notifying landowners about vegetation management activities, establishing a buffer for aquatic environments, not treating any sensitive areas and limiting frequency of use, where necessary.
- Conducting construction activities as per applicable noise bylaws.

- Although EMF levels within and outside the Dorsey IPL ROW are anticipated to be below limits recommended by national and international agencies, Manitoba Hydro understands there is a perceived concern of potential health effects from EMFs. Manitoba Hydro therefore continues to: monitor and/or support research, actively communicate with interested parties, provide information and take measurements of magnetic fields upon request.

- Traditional land and resource use:
  - Potential effects:
    - Change in land and resources used for plant harvesting/hunting and trapping.
    - Change in land and resources used for travel.
    - Change in cultural sites
  - Key mitigation measures:
    - Potential adverse effects were reduced to the extent feasible by transmission line routing and by taking concerns and recommendations from engagement into account during the Project planning process.
    - The establishment of Project environmental protection measures to mitigate potential effects on fish, vegetation, and wildlife.
    - The establishment of a Cultural and Heritage Resources Protection Plan, describing the commitment to safeguard cultural and heritage resources and describing how to appropriately handle human remains or cultural and heritage resources discovered or disturbed during the construction of the Project.

- Heritage Resources Effects:
  - Potential effects:
    - Change in number of known Heritage resource sites and change in sites inadvertently exposed.
    - Project components requiring subsurface disturbance could disturb artifacts.
    - Change in cemeteries and burials
  - Key mitigation measures:

- Negative effects to known sites with high priority heritage resources and cemeteries/burials were avoided during transmission line routing.
- Implementation of the Cultural and Heritage Resource Protection Plan which includes a protocol to stop all activity in an area if a previously unidentified heritage resource is discovered until the regulator has been informed, a qualified archaeologist has examined the objects and site context, and clearance from the regulator has been granted.
- Education of construction contractors for the appropriate protocol in the event that heritage resources, or objects thought to be heritage resources, are uncovered.
- Pre-construction monitoring by a professional archaeologist in areas in close proximity to known heritage resource sites or sites identified as being culturally sensitive by First Nation or Metis. This includes extant buildings or building foundations, stone features, burial sites and any other heritage resources.
- Protective barriers will be placed around heritage resource sites that are inadvertently found during construction so that the area can be protected while work proceeds.
- Where avoidance of identified sites is not possible there will be a controlled surface collection or salvage excavation undertaken.

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Appendix A

Environmental Statutes

Federal Environmental Statutes

Act	Purpose	Regulated Activity	Application to Project
PERMITS APPLICABLE TO PROJECT			
THE EXPLOSIVES ACT [R.S.C., 1985, c. E-17]	Addresses the manufacture, testing, sale, storage, and importation of explosives	Use of explosives in construction; will be stored at Riel Converter Station	Magazine licences obtained Approval letters/equivalent documentation required under s.178 of Explosives Regulations, 2013
THE MIGRATORY BIRDS CONVENTION ACT, 1994 [SC 1994, c. 22]	Protection of migratory birds in Canada and the United States, including damaging nest and harassment	Activities that have the potential to destroy or harass migratory birds and/or their nests	Permit obtained September 2, 2014 to conduct bird mortality monitoring. Intent is to avoid restricted activities by timing of construction
PERMITS NOT APLICABLE			
THE FISHERIES ACT [R.S.C., 1985, c. F-14]	Protection of fisheries in Canada that are part of a commercial, recreational. or Aboriginal (CRA) fishery, or to fish that support such a fishery	Activities in or adjacent to waterbodies that have the potential to result in serious harm to CRA fisheries	Design of Project is intended to avoid serious harm to CRA fisheries
THE NAVIGATION PROTECTION ACT [R.S.C., 1985, c. N-22]	Protection of designated navigable waters, as a result of the construction of any work, any dumping of fill or excavation of materials from the bed of a navigable river	Works crossing navigable waterbodies (Assiniboine and Red rivers)	Not applicable to IPLs as per section 58.301 of *National Energy Board Act*
THE CANADA WILDLIFE ACT [R.S.C., 1985 c. W-9]	Conservation and management of the wildlife resources of Canada, including protection of endangered wildlife	Permit required for activities in Wildlife Areas	Proposed route avoids national parks and national protected areas
GUIDANCE ONLY			
THE TRANSPORTATION OF DANGEROUS GOODS ACT [S.C., 1992, c.34]	Promotes public safety (human life and health of property and the environment) in the transportation of dangerous goods, including qualifications, emergency response plans, etc.	Activities involving the transportation of dangerous/hazardous materials	Guidance on transportation of dangerous/hazardous materials
THE SPECIES AT RISK ACT [S.C., 2002, c.29]	Protection to prevent wildlife species from becoming extirpated/ extinct, including the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; and to manage species of	Permit required for activities affecting a wildlife species at risk or any part of its critical habitat if it is scientific research and/or benefits the species or its critical habitat, or affecting the species is incidental to carrying out the activity	Guidance on avoidance of activities in areas with Species at Risk

	special concern to prevent them from becoming endangered or threatened		
CANADA TRANSPORTATION ACT (S.C. 1996, c. 10)	Section regulates utility crossings of railways. Requirement for a crossing agreement to be negotiated between the proponent and the railway which is filed with the Canada Transportation Agency.	Routing over railway crossings	Guidance requiring crossing agreement with the railway and the Canada Transportation Agency
THE CANADA WATER ACT [R.S.C., 1985, c. C-11]	Management of the water resources of Canada, including the conservation, development, and utilization of water resources, and guidelines for Canadian drinking water quality	Activities adjacent to watercourses	Guidance on managing risks to water quality
THE CANADIAN ENVIRONMENTAL PROTECTION ACT [S.C., 1999 c. 33]	Provides protection for the environment and health of Canadians through managing toxic substances, preventing and responding to environmental emergencies and enforcement	Potential environmental emergencies, export/ import of waste/ hazardous materials, petroleum storage tanks, etc.	Guidance in managing toxic/hazardous materials
THE FEDERAL SUSTAINABLE DEVELOPMENT ACT [Bill C-474 (S.C. 2008, c.33)]	Development and implementation of a Federal Sustainable Development Strategy and associated goals and targets	Various project activities	Guidance on sustainable development
HISTORIC SITES AND MONUMENTS ACT Act (R.S.C., 1985, c. H-4)	Establishes the administration of historic places, or lands for historic museums, building or other place of national historic interest or significance, and includes buildings or structures that are of national interest	Potential routing near important national historic sites	Guidance on locations of important national historic sites
THE HAZARDOUS PRODUCTS ACT [R.S.C., 1985 c. H-3]	Prohibitions for the manufacturing, importing, selling, advertising, packaging, and labelling of consumer products, including those that are a danger to human health and safety	Use of hazardous products	Guidance on use of hazardous products
THE NATIONAL FIRE CODE OF CANADA, 1995	Provides fire safety inside and outside new and existing buildings, including spill control measures and storage of combustibles	Activities that have the potential to cause fires in/adjacent to buildings	Guidance on fire safety issues
THE INDIAN ACT	Protection of resources on Indian Reserves and	Potential routing through	Avoidance of any First Nation

[R.S.C., 1985 c. I-5]	protected lands	Aboriginal reserves	Reserve lands
RADIO COMMUNICATIONS ACT [.S.C., 1985, c. R-2]	Regulations addressing interference with radio signals	Technical requirements and standards for interference-causing equipment, such as transmission lines	Guidance on radio interference
PEST CONTROL PRODUCTS ACT [S.C. 2002, c. 28]	Provides for the protection of human health and safety and the environment by regulating products used for the control of pests	Use of registered pest control products.	Guidance on use of pest control products

Provincial Environmental Statutes

Act	Purpose	Regulated Activity	Application to Project
PERMIT REQUIRED			
THE CROWN LANDS ACT [C340]	Protection, control, and prudent use of Crown lands.	Entry, work and vehicle use	Permits required authorizing specified work to be performed on and authorizing entry for the purpose of the work
THE DANGEROUS GOODS HANDLING AND TRANSPORTATION ACT [D12]	Regulates aspects of dangerous goods affecting the environment and/or public health, including handling, disposal, etc.	Handling, and disposal of dangerous materials, including accidental spills clean up/reporting	Permit required for carriers, and to store/dispose of petroleum/hazardous waste
THE FIRES PREVENTION AND EMERGENCY RESPONSE ACT [F80]	Provides for the control of activities concerned with prevention, detection, and extinguishment of fires	Any activities associated with combustible materials	Work camp occupancy permit required
THE FOREST ACT [F150]	Provides for the regulation and administration of forests within Crown lands and provincial forests	Cutting/removing timber on crown lands	Permit required to enter forest land to cut or remove timber
THE HERITAGE RESOURCES ACT [H 39.1]	Provides for the designation/protection of heritage objects and resources/sites.	Conducting heritage field studies and managing/protecting heritage resources that are discovered	Permit required for conducting heritage investigations
THE HIGHWAYS PROTECTION ACT [H50]	Protects the safety of persons using the highways, and controls the location, construction, and use of entrances/exits from certain highways; adjacent land use or structures erected along certain highways	Establishment of access roads and tower placement	Permits required to construct and entrance/exit from certain highways and to erect a structure other than an advertising sign within a controlled area (between the limited access highway or freeway and the control line)
THE MINES AND MINERALS ACT [M162]	Provides for the administration of mines and minerals of Manitoba, which includes the right to the ores, minerals, and mines upon or under the surface in Crown lands	Establishment and use of quarries/borrow areas for construction materials	Surface (casual or exploration) permit or lease required (under Crown Lands Act) to gain access to Crown lands to establish/use a quarry

THE PESTICIDES AND FERTILIZERS CONTROL ACT [P40]	Addresses the supply, sale, distribution, and application of pesticides or fertilizers	Potential use of pesticides for vegetation control	Licence required for the applicator and Pesticide Use Permit required
THE PROVINCIAL PARKS ACT [P20]	Provides for the conservation and management of flora and fauna, preservation of specified areas and objects of geological, cultural, ecological, or other scientific interest, etc.	Project ROW crosses Duff Roblin Heritage Provincial Park	Permits are required for constructing trails, establishing winter roads, grooming snowmobile trails, snow clearing on roads, trails, or bodies of water, excavating, blasting, or drilling, cutting trees, burning for the purpose of clearing trees or brush, applying pesticide, drilling wells
THE PUBLIC HEALTH ACT [P210]	Relates to the preservation of life and health, including conditions or circumstances that may contaminate or pollute food, air, or water, etc.	Food handling establishments in camps	Food handling permit required if camps include a kitchen
THE WATER RIGHTS ACT [W80]	Provides for the administration of matters related to the construction or operation of certain water control works	Ground water exploration activities	Permit is required to withdraw water from a provincial surface or ground water source, including exploration activities
THE WILDFIRES ACT [W128]	Provides for the avoidance of wildfires in areas throughout Manitoba other than cities, towns, villages, or national parks	Any activities involving fires (e.g., timber disposal)	Permit is required to burn clearing debris.
GUIDANCE ONLY			
THE WILDLIFE ACT [W130]	Provides for the conservation of wildlife and their habitat in Manitoba, including disturbance, habitat destruction (e.g., nests, eggs), etc.	Activities in wildlife areas, including specifically areas with woodland caribou	Avoidance of wildlife areas
THE WORKPLACE SAFETY AND HEALTH ACT [W210]	Established to protect workers from risks to their safety, health, and welfare arising out of, or in connection with, activities in their workplaces	Health and safety of individuals working on the Project	Guidance in managing worker health and safety
THE ENDANGERED SPECIES AND ECOSYSTEMS ACT [E111]	Ensures the protection and enhances the survival of endangered and threatened species	Work in areas where protected species occur/may occur	Guidance in managing work in the vicinity of protected species
THE CONSERVATION AGREEMENTS ACT [C.C.S.M. c. C173]	Established to promote the principles of sustainable development, that land owners and conservation agencies be able to enter into conservation agreements for the protection and enhancement of natural ecosystems, wildlife or fisheries habitat and plant or animal species	Limitations on development activities are based on the features to be protected. Specifically, drainage of wetlands, conversion of grasslands and clearing of wooded areas may be restricted.	Guidance on poterntial effects to wetlands, grasslands, wooded areas
THE DUTCH ELM DISEASE ACT [S.M. 1998, c. 17]	Regulates the appropriate management and prevention of Dutch elm	The management, removing and disposing of elm trees	Guidance on dealing with elm trees

	disease on all land in Manitoba except land administered and controlled by the Crown in right of Canada		
THE FOREST HEALTH PROTECTION ACT [F151]	Protects the health of trees and prevents forest diseases and insects that are not native to Manitoba from becoming established in the province	Use of equipment from areas with non-native insects/disease	Guidance on managing risks of introducing non native species
THE GROUND WATER AND WATER WELLS ACT [G110]	Applies to all sources of groundwater and all wells, for the purpose of obtaining ground water or scientific data on ground water, whether water is obtained or not	Well drilling and potential contamination from spills	Licence required for the operator to engage in the business of drilling wells
THE NOXIOUS WEEDS ACT [N110]	Addresses the control of noxious weeds and noxious weed seeds	Use of equipment potentially coming from areas with noxious weeds, managing noxious weeds on Project	Guidance on dealing with risks of introducing noxious weeds
THE OZONE DEPLETING SUBSTANCES ACT [O80 1990]	Provides for the prevention, reduction, and eventual elimination of ozone-depleting substances	Potential use of ozone depleting substances	Guidance on dealing with ozone depleting substances
THE PEATLANDS STEWARDSHIP ACT [C.C.S.M. c. P31]	Designates provincially significant wetland areas that are protected from all types of development	A mineral peat area is within the vicinity of the Project	Avoidance of this sensitive area
THE PLANNING ACT [P80]	Establishes special planning areas and policies to provide for protection and conservation of the environment and of natural resources; creation and preservation of wilderness areas, etc.	Potential activities within designated special planning areas	Guidance on avoidance of any special planning areas; not applicable to Crown corporations
THE SUSTAINABLE DEVELOPMENT ACT [S270]	Creates a framework through which sustainable development will be implemented in the provincial public sector and promoted in private industry and in society generally	Requires Manitoba Hydro to prepare and adopt a corporate sustainable development code of practice	Implementation/reference to corporate sustainable development code of practice
THE WASTE REDUCTION AND PREVENTION ACT [W40]	This Act was passed to reduce and prevent the production and dissemination of waste in the province	Generation of solid waste, electrical equipment, used oil, etc.	Guidance on managing solid waste
THE WATER PROTECTION ACT [W65]	Provides for the protection of Manitoba's water resources and aquatic ecosystems including the establishment of water quality standards, objectives, and guidelines, regulation of harmful non-native species, etc.	Activities within/adjacent to watercourses	Guidance on managing risks to water quality

Appendix B

Project Maps