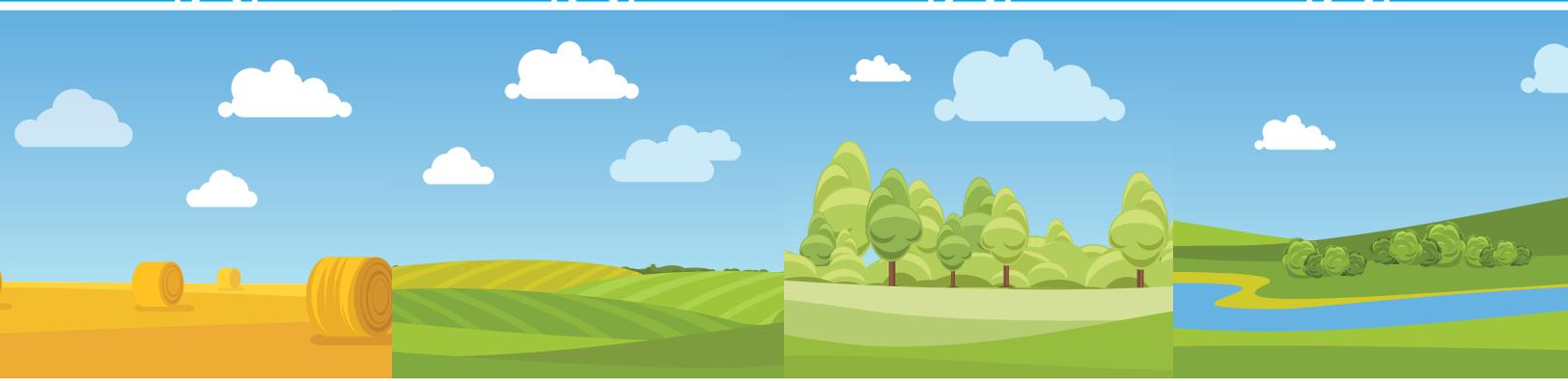
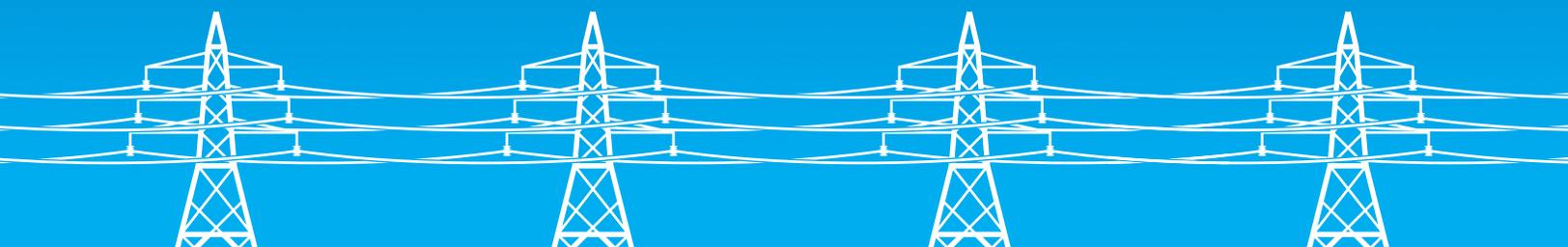


REPORT ON PUBLIC HEARING

MANITOBA- MINNESOTA

TRANSMISSION PROJECT

SEPTEMBER 2017





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September 12, 2017

Honourable Rochelle Squires
Minister of Sustainable Development
Room 330 Legislative Building
450 Broadway
Winnipeg, Manitoba R3C 0V8

Re: Manitoba-Minnesota Transmission Project

Dear Minister Squires:

The Panel is pleased to submit the Clean Environment Commission's report on the Public hearing with respect to the Manitoba-Minnesota Transmission Project.

Sincerely,



Serge Scrafield, Chair



Ian Gillies



Reg Nepinak



Laurie Streich



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Foreword

The Clean Environment Commission is established under *The Environment Act*, wherein it is given an important role in the protection and management of Manitoba's environment. Among the commission's primary roles are "providing advice and recommendations to the minister" and "developing and maintaining public participation in environmental matters."

The Clean Environment Commission's review of the Manitoba-Minnesota Transmission Project took place within the context of the intent and purposes of the act. Specifically, the commission endeavoured to ensure that: the environment was protected and maintained in such a manner as to sustain a high quality of life; the review process complemented other planning and policy mechanisms, particularly the principles and guidelines for sustainable development; a thorough environmental assessment of the project had been undertaken; and an opportunity for public consultation had been provided.

The commission has always sought to contribute to improving the engagement of all Manitobans in environmental decisions. It provided ample opportunity for the public to be involved at these hearings, including the funding of representative participants. There was substantial input from the public, particularly landowners and consumer

representatives, during the hearings. The report has taken into account that input.

The commission was specifically directed by the minister, in revised terms of reference, to "include consideration of the effect on First Nation, Metis and other Aboriginal communities of any changes to the environment." The commission took this direction very seriously and provided opportunities, supported by funding, for written submissions and presentations during the hearings from First Nation communities and the Manitoba Metis Federation. The input from these participants was significant and is reflected in this report.

The commission is also dedicated to improving the practice of environmental assessment. During our hearings, Manitoba Hydro often noted that it was following recommendations made by the commission in its report on the Bipole III Transmission Project. Also, the commission heard from a number of participants that Manitoba Hydro's environmental assessment processes were clearer and significantly improved in comparison to the past. However, shortcomings were also noted and suggestions made for further improvement of the process.

After conducting a thorough public review of the project, including 18 days of hearings, the commission has concluded that

the environmental impact statement and the routing methods for this transmission project were generally transparent, balanced and respectful of the views of affected people. Nevertheless, areas where the processes could be enhanced have been identified.

Manitoba Hydro facilitated engagement in the project by funding traditional knowledge and land use studies, as well as by organizing a large number of public open houses, meetings and landowner workshops. However, the commission will also note that inclusion of members of affected communities and landowners earlier in the routing process would increase the effectiveness of this involvement.

The commission notes there was improvement in the guidance provided by the Department of Sustainable Development in the preparation and review of the EIS. The commission encourages continued progress on this path.

The commission is satisfied that the involvement and participation of First Nations and Metis and as well as the engagement of the public in the Manitoba-Minnesota Transmission Project meets the intent of the act and the commission is therefore able to make project recommendations to the minister. The commission panel is recommending that an *Environment Act* licence be issued to Manitoba Hydro for the construction and operation of the Manitoba-Minnesota Transmission Project. It will also recommend that conditions be attached to the licence primarily to ensure that remaining environmental concerns are addressed. In addition, the commission will offer advice to the Manitoba government and to Manitoba Hydro aimed at further improving the environmental assessment process and Hydro's transmission line siting practices.

The commission will be encouraging Manitoba Hydro to become a leader in right-of-way management and in engagement of affected communities and landowners in the ongoing monitoring of the project. The commission will propose that Manitoba Hydro and the Department of Sustainable Development, with the agreement of the communities, integrate the various communities and interests into one monitoring process to lessen polarizing points of view and provide for a process that brings together diverse perspectives in order to help minimize project impacts.

The commission will also offer advice to the government and others about actions to maintain biodiversity in southeastern Manitoba.

Acknowledgements

I would like to thank my fellow panelists, Reg Nepinak, Laurie Streich and Ian Gillies, as well as the staff and advisors who supported us through the process.

Serge Scrafield
Chair, Clean Environment Commission
September 2017

Executive Summary

On December 31, 2015, the Minister of Conservation and Water Stewardship (now Sustainable Development) asked the Clean Environment Commission to conduct public hearings into the application by Manitoba Hydro for an *Environment Act* licence for the Manitoba-Minnesota Transmission Project (MMTP, or the project). In a letter to the commission, the minister provided terms of reference for the hearings and for the commission's report. In accordance with *The Environment Act*, the commission was asked to review Manitoba Hydro's environmental impact statement, including its public consultation program. The minister also asked the commission to consider, as input to the hearings, documents produced by the Technical Advisory Committee of provincial officials and federal specialists, as well as any other documentation produced in the review process. The commission was also requested to make a recommendation on whether an *Environment Act* licence should be issued for the project and on any conditions that should be attached to such a licence. The commission was directed to hold hearings in Winnipeg and in areas that would allow people near the project area to have reasonable access to the hearings. Accordingly, hearings were held in Winnipeg and in La Broquerie during the months of May and June, 2017.

In the terms of reference for these hearings, the commission was tasked

with considering Manitoba Hydro's project consultation summary and the effect on First Nations, Metis and other Aboriginal communities. After reviewing the environmental impact statement (EIS) and related technical documents and after conducting hearings in which Manitoba Hydro staff and consultants were questioned by participants and the hearing panel, the commission believes that Manitoba Hydro has made progress in the way it plans projects, engages communities and incorporates community concerns and knowledge. It was apparent to the commission that the corporation and its employees have been working diligently to improve performance in these areas since the hearings into the Bipole III Transmission Project in 2012-13.

The EIS and its supporting documents described Manitoba Hydro's processes for engaging communities with an interest in the project, the process of selecting a route for the transmission line, potential effects on 12 aspects of the biophysical and socio-economic environments referred to as valued components and Manitoba Hydro's programs for environmental management and monitoring. Both in the EIS and in the hearings, selecting a route for the transmission line was a central issue. A major part of Manitoba Hydro's effort in planning the project was determining a

route that would avoid, as much as possible, potential effects on the natural and built environments, while efficiently meeting the corporation's technical requirements and managing construction and maintenance costs. The nature of the project area influenced the choices that were made and the debates that were heard, both during Manitoba Hydro's engagement programs and during the commission's hearings.

The eastern portion of the Route Planning Area is largely Crown-owned land with extensive forest and wetland areas. The western portion is largely privately owned land, much of which is used for agriculture and some of which is used for residential development. A route in the east would tend to have fewer effects on agriculture and residential development. A route in the west would tend to have fewer effects on the natural environment and traditional land use. Engineering criteria – including Manitoba Hydro's desire to keep a buffer between the MMTP and the north-south portion of an existing 500 kV transmission line in the area and the difficulty of building a line across extensive wetlands – favoured avoiding the east. Ultimately, Manitoba Hydro's process led to selection of a transmission line route that is a compromise among these preferences and restrictions.

After consideration of the body of evidence, the commission recommends that the Manitoba-Minnesota Transmission Project be approved for a licence under *The Environment Act*. The commission recommends a number of conditions be attached to the licence in order to provide greater assurance that the project can be carried out without unduly compromising environmental quality. Some of these conditions refer to monitoring and are intended to be responsive to uncertainty, ensure transparency and build trust and openness. The commission will also

make non-licensing recommendations aimed at continual improvement in assessment, engagement, monitoring and management of projects with potential to affect the environment. This report and the recommendations it contains are intended to provide further tools and encouragement to support continual enhancement of environmental planning and operations.

Chapter One

Introduction

1.1 The Manitoba Clean Environment Commission

The Manitoba Clean Environment Commission is an arms-length, provincial agency established under the authority of *The Environment Act* (1988), wherein the commission is mandated to provide advice and recommendations to the Minister of Sustainable Development*, and to develop and maintain public participation in environmental matters. In the context of a review such as that undertaken for the Manitoba-Minnesota Transmission Project, this includes holding open hearings to allow members of the public to challenge the environmental assessment conducted by the project's proponent (Manitoba Hydro) and to state their opinions to the hearing panel.

*For the sake of clarity, this report will refer to the provincial department by its current name, Manitoba Sustainable Development, except in places where documents that use the former name (Manitoba Conservation and Water Stewardship) are being directly quoted.

1.2 The Project

The Manitoba-Minnesota Transmission Project (the project) consists of a 500-kilovolt (kV) alternating current (AC) power line running from the Dorsey Converter Station northwest of Winnipeg to the Manitoba-

Minnesota border near Piney, plus additions and upgrades to three associated transmission stations and modifications to two existing power lines. The station upgrades are to Dorsey, the Riel Converter Station (east of Winnipeg) and Glenboro South stations. The largest component of the project is construction of 213 kilometres of new transmission line, which will run around the south end of Winnipeg from Dorsey to Riel, from there due east to a point south of Anola, and angle to the southeast, connecting with the new 500 kV AC Great Northern Transmission Line (GNTL) at the border near Piney. The GNTL will then run nearly 400 km to the Blackberry substation in the Iron Range region of Minnesota, approximately 100 km northwest of Duluth. Minnesota Power is the proponent for the GNTL in the regulatory process in the United States.

Manitoba Hydro describes the purpose of the MMTP as threefold:

- to deliver contracted power to and from the United States pursuant to new long-term power sale agreements,
- to improve reliability for Manitoba power users by increasing Manitoba Hydro's capacity for purchase of electricity in the event of emergency or drought situations, and

- to increase Manitoba Hydro’s capacity to participate in organized electricity markets in the United States.

1.3 The Proponent

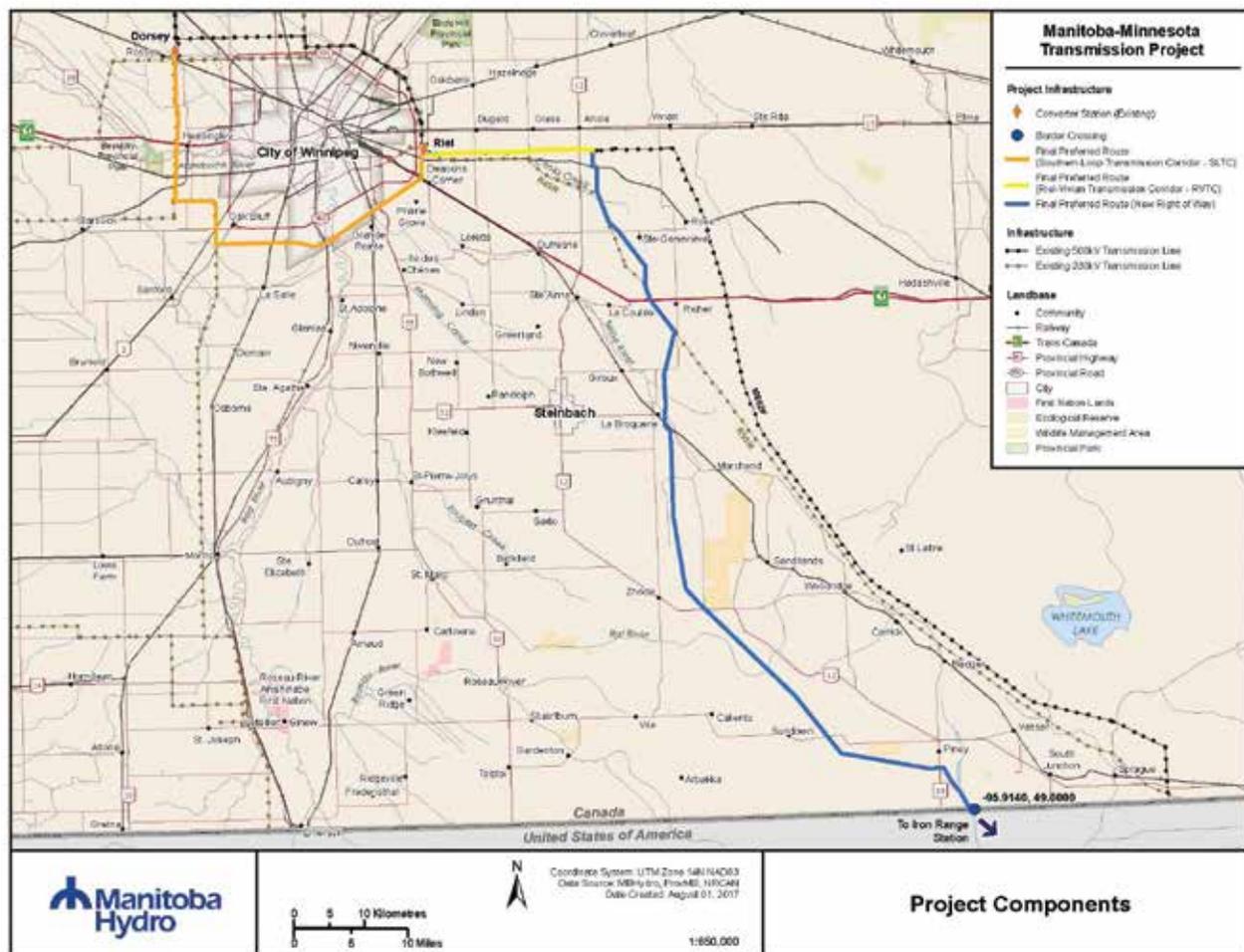
Manitoba Hydro is a Crown corporation established in 1961, mandated to provide for the power needs of Manitobans. The utility is overseen by the Manitoba Hydro-Electric Board, which is appointed by the Government of Manitoba and reports to the minister responsible for *The Manitoba Hydro Act*. The purposes of *The Manitoba Hydro Act* are: “to provide for the continuance of a supply of power adequate for the needs of the province, and to engage in and to promote economy

and efficiency in the development, generation, transmission, distribution, supply and end-use of power and, in addition...to provide and market products, services, and expertise related to the development, generation, transmission, distribution, supply and end-use of power, within and outside the province, and to market and supply power to persons outside the province on terms and conditions acceptable to the board.”

1.4 Terms of Reference

On December 31, 2015, the Minister of Conservation and Water Stewardship (now Sustainable Development) wrote to the commission requesting that the commission

Fig 1.1: Manitoba Minnesota Transmission Project Components. (Courtesy of Manitoba Hydro.)



hold public hearings on Manitoba Hydro's application for an *Environmental Act* Licence for the Manitoba-Minnesota Transmission Project.

The terms of reference, revised on February 15, 2017, specified the commission's mandate for the hearings and the scope of the review, as follows:

Terms of Reference

"Pursuant to Section 6 (5.1) of *The Environment Act*, the Minister has determined that the Terms of Reference the Commission is to follow are:

- To review the EIS, including the proponent's public consultation summary. Note that a detailed technical review will be completed by provincial agencies who are members of the TAC [Technical Advisory Committee]. Federal specialists will also be invited to provide comments on the project as part of the TAC review. Documents produced during this assessment should be considered by the Commission as input for the hearings;
- To hold public hearings for the Commission to consider stakeholder and public input; and
- To prepare and file a report with the Minister of Sustainable Development outlining the results of the Commission's review and providing recommendations for the Minister's consideration. The report should be filed within ninety (90) days from the date of completion of hearings as per Section 7(3) of *The Environment Act*.

Mandate of the Hearings

The Commission shall conduct the hearings in general accordance with its Process Guidelines Respecting Public Hearings.

The Commission may, at any time, request that the Minister of Sustainable Development review or clarify these Terms of Reference.

Hearings should be located in areas that will allow reasonable access to potential stakeholders, including in the project area and Winnipeg.

The Commission shall, within the mandate of the hearing and the Terms of Reference provided by the Minister as noted above, provide a report recommending:

- Whether an *Environment Act* licence should be issued to Manitoba Hydro for the Manitoba-Minnesota Transmission Project, and
- Should the Commission recommend issuance of a licence, any conditions that should be included in the licence.

The Commission's recommendation shall incorporate, where appropriate, the Principles of Sustainable Development and Guidelines for Sustainable Development as contained in *Sustainable Development Strategy for Manitoba*.

The review by the Commission of the EIS and the public hearings will include consideration of the effect on First Nations, Metis and other Aboriginal communities of any changes to the environment including those related to (1) health and socio-economic conditions, (ii) physical and cultural heritage, (iii) the current use of lands and resources for traditional purposes, and (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Manitoba will provide an opportunity for First Nations, Metis and other Aboriginal communities to advise of any concerns about potential adverse effects of the project on the exercise of Aboriginal or treaty rights through a Crown-Aboriginal Consultation process. While the eventual licensing decision pursuant to *The Environment Act* will consider the results of the consultation process, Crown-Aboriginal consultation is a distinct process from the public review process, including hearings to be conducted by the Commission. As such, the Commission is not being called on to conduct a Crown-Aboriginal consultation process or to consider the appropriateness or adequacy of the consultation process for the project. The Commission also need not assess whether identified impacts may constitute an effect on the exercise of Aboriginal or treaty rights.”

1.5 The Hearings

Public hearings were held from May 8 to June 6, 2017, in Winnipeg, except for one day and one evening session in La Broquerie, held to facilitate participation from residents in the project area. Written submissions were welcomed and the hearing record closed on June 16, 2017.

During these hearings, testimony was given by representatives of Manitoba Hydro and participant groups and organizations and by the public at large. Approximately 75 individuals, including 29 representatives of Manitoba Hydro, participated in person at the hearings. The commission also received 16 written submissions. As a result of this information gathering, the commission has gained sufficient understanding of the project and its potential impacts, and of Manitoba Hydro’s First Nation, Metis and public engagement programs to make recommendations on the issuance of an

Environment Act licence and on conditions to be attached to such a licence.

1.6 Section 35 of Canada’s Constitution

Section 35 of the *Constitution Act* (1982) stipulates that “[t]he existing Aboriginal and treaty rights of the Aboriginal peoples of Canada are hereby recognized and affirmed.” While Section 35 is not an environmental statute, it does require consultation with Aboriginal peoples whose rights may be impacted in some fashion by a project. The process of consulting with Aboriginal peoples in accordance with Section 35 is not a regulatory process. The obligation to initiate and carry out consultations with respect to Section 35 is that of the province and/or of Canada, depending upon the nature of the project under consideration, its location and its ownership.

As noted in the terms of reference, in the case of this project, the Government of Manitoba is conducting Crown-Aboriginal consultations. The commission hearings played no role in these consultations.

1.7 The Report

This report to the minister presents an overview of the project, as described by the proponent, and a summary of the information and concerns presented by individuals and organizations during the hearings. The commission provides comments on environmental, process and policy issues as identified by the public, participating groups and the commission. All testimony made during hearings has been transcribed and is available on the commission’s website, as are written submissions and presentation materials. A list of all hearing participants is included in Appendix II to this report.

This report is divided into 14 chapters, covering the project, the planning and consultation processes and the main subject areas of the EIS. The report includes topics raised in hearings and provides the commission's recommendations to the minister.



Chapter Two

The Licensing Process

2.1 Needed Licences and Approvals

The Environment Act sets out the environmental assessment and licensing process for developments such as the Manitoba-Minnesota Transmission Project (MMTP, or the project). The provincial process encourages early consultation by project proponents and provides for public participation at various stages of the province's review of a project. *The Classes of Development Regulation* (Manitoba Regulation 164/88) classifies projects as Class 1, 2 or 3, with Class 3 developments generally being larger and more complex and requiring a more comprehensive public review. The MMTP is a Class 3 development under "Transportation and Transmission" because it consists of "electrical transmission lines greater than 230 kV, and associated facilities." In order to build the project, Manitoba Hydro requires an *Environment Act* licence. To obtain that licence, the project must be assessed in accordance with the process outlined in *The Environment Act*.

2.2 Manitoba Review Process for an Environment Act Licence

Manitoba's process for an *Environment Act* licence begins with the proponent submitting an *Environment Act* Proposal Form (EAPF)

to Manitoba Sustainable Development. The proponent also at this time presents a draft environmental assessment scoping document, which proposes the appropriate framework and scope for conducting an environmental assessment – essentially outlining the potential impacts that need to be assessed and the area in which the assessment will occur. The proponent's draft scoping document is then reviewed by government agencies and public input is sought to develop the final scoping document.

Manitoba Hydro submitted its EAPF and draft scoping document to the department on November 21, 2014. Staff of the Environmental Approvals Branch, as well as members of a cross-departmental Technical Advisory Committee, then reviewed the proposal form and the draft scoping document and provided comments. Members of the public were also invited to provide their comments and concerns about the project and the documents. The final scoping document was then issued by Sustainable Development on June 24, 2015, providing the guidelines for Manitoba Hydro's environmental impact statement (EIS). The EIS for the project was prepared in response to the scoping document.

The scoping document stipulated that the EIS was to include:

- a discussion of the regulatory and policy framework for the project;

- a description of the project and all its components;
- a discussion of the public engagement process and the First Nations and Metis engagement process;
- a discussion of the process for the selection of the transmission line's route;
- a description of the environmental and socio-economic settings for the project;
- selection of "valued components" to be used to assess the project's effects on the biophysical and socio-economic environment;
- discussion of mitigation of effects caused by the project;
- assessment of residual effects after mitigation;
- assessment of effects that will act cumulatively with effects of other projects;
- follow-up and monitoring;
- the potential for accidents, malfunctions and unplanned events;
- the effect of the environment on the project; and
- how sustainable development principles have been incorporated into the project.

Not all developments covered in *The Environment Act* necessarily require an EIS, but the MMTP did, owing to its size and complexity. The EIS for the project was filed with Manitoba on September 22, 2015. Upon the filing of the EIS, *The Environment Act* mandates that the EIS be accessible for a two-month period, during which interested parties may review the material and provide comment.

The Minister of Sustainable Development has the discretion to direct that there be a public hearing to review the EIS on such terms as the minister determines. If there is to be a public hearing of a project, it will be held before the Clean Environment Commission. The commission is required to report to the minister following such a hearing and provide recommendations regarding the project.

2.3 Federal Regulatory Review and Decision Making

The MMTP is a "designated project" under the *Canadian Environmental Assessment Act* (CEAA 2012) and is therefore subject to environmental assessment under the act. CEAA states that a transmission line with a voltage of 345 kV or more that requires 75 km or more of new right of way (ROW) is a designated project.

The National Energy Board (NEB) is the responsible authority designated under the *National Energy Board Act* for federal review of the project. The NEB is also responsible for regulating the construction and operation of international power lines. Because the project will be used for import or export of power to the United States, it is an international power line and Manitoba Hydro will require authorization under the *National Energy Board Act* to construct and operate it.

Notwithstanding these areas of federal jurisdiction, the *National Energy Board Act* allows for the application of provincial law relating to environmental assessment provided an order-in-council has been issued by the government of the province where the international power line is located. The Manitoba government issued an order-in-council on November 6, 2013, designating the Minister of Sustainable Development as the provincial regulatory authority for the project. Manitoba Hydro intended its EIS for the

project to meet both the federal and provincial requirements.

2.4 Role of the Clean Environment Commission

The commission's role in this regulatory process is to make recommendations on the granting of a licence under *The Environment Act*. In making its determination as to the effects of the project and its recommendations on licensing of the project, the commission relied on the EIS, technical experts retained by the commission, presentations by participants and the public, testimony of expert witnesses and questioning of expert witnesses.

The commission was required, under the terms of *The Environment Act*, to submit its report within 90 days of the closing of the record for the hearings. Should the commission recommend the granting of a licence, the minister must either adopt the commission's licensing recommendations or provide written reasons for not doing so.

2.5 Need For and Alternatives To Review

Consideration of the need for and alternatives to the project (known as an NFAT review) was not within the scope of the EIS, nor within the terms of reference for the Clean Environment Commission's hearings on the project. The Public Utilities Board of Manitoba (PUB) conducted an NFAT review of the project beginning in August, 2013, in hearings conducted into Manitoba Hydro's development plans. The NFAT review considered economic and technical matters, but not environmental impacts and socio-economic impacts. The hearing process began with Manitoba Hydro filing its business case, followed by two rounds of information requests from the PUB panel and interveners, evidence presented by expert witnesses from the interveners and another

round of information requests. A public hearing was held from March 3 to May 26, 2014. After the conclusion of the hearing process, the PUB panel issued a report with recommendations on Manitoba Hydro's development plans, in which it recommended, among other things, that Manitoba Hydro be given permission to proceed with a "U.S. transmission interconnection." The panel's report concluded that a new international transmission line "provides increased firm transmission access extending into Minnesota, provides important, increased reliability, and supports import and export of electricity." Following this, an order-in-council authorized Manitoba Hydro to enter into agreements and take other necessary actions related to the construction and operation of a new transmission interconnection.

2.6 The Licensing Decision

Ultimately, it is the Minister of Sustainable Development who will decide whether a licence should be issued for the project under *The Environment Act*. The minister's decision will be based, at least in part, upon the advice and recommendations contained in the Clean Environment Commission's report on the public hearings. In addition, the minister's decision will be informed by the report of the consultations with Indigenous communities, required under s. 35 of the *Constitution Act* (1982), as well as advice from officials in the department.

In reaching a recommendation on licensing of the project, the commission has relied on information from the EIS and technical data volumes, two rounds of information requests, Aboriginal traditional knowledge and traditional land use studies and testimony and submissions made during the 18 days of hearings. After considering this large amount of information, the commission is satisfied that the environmental impacts of the project have been comprehensively

described and addressed and that First Nations, the Metis and the public have been meaningfully engaged. While the commission recommends issuance of an *Environment Act* licence for the project, it will also address several concerns brought to light through this process through proposed licence conditions and non-licensing recommendations.

Licensing Recommendation

The commission recommends that:

- 2.1 A Class 3 *Environment Act* licence be issued to Manitoba Hydro for the Manitoba-Minnesota Transmission Project, subject to licensing conditions outlined in subsequent recommendations in this report.

Chapter Three

The Public Hearing Process

3.1 Clean Environment Commission

The panel assigned to conduct the public hearings on the Manitoba-Minnesota Transmission Project consisted of Serge Scrafield (chairperson of the panel and of the Clean Environment Commission), Ian Gillies, Reg Nepinak and Laurie Streich.

3.2 Public Participation

3.2.1 Participants

This report uses two terms to describe members of the public who took part in the process: participants and presenters.

Participants are groups who were substantially involved in the process. Participants took part in the pre-hearing process, during which they reviewed the environmental impact statement (EIS) and sought further information before the beginning of hearings, and many of them brought their own expert witnesses to the hearings. Many participants were represented by counsel. Participants were able to ask questions of the proponent and, in limited circumstances, of each other. In turn, they may also have been asked questions by the proponent. Many of the participants received funding through the Participant Assistance

Program, in order to help them analyze and assess the impacts of the project and prepare for the hearings. Participants were:

- The Consumers' Association of Canada (Manitoba Branch),
- Dakota Plains Wahpeton Oyate,
- The Manitoba Metis Federation,
- Manitoba Wildlands,
- Peguis First Nation,
- Southern Chiefs' Organization, and
- Southeast Stakeholders' Coalition.

3.2.2 Participant Assistance Program

Funding for participants is established by the Participant Assistance Regulation, under which *The Environment Act* creates a proponent-funded program that ensures that qualifying public organizations have access to resources to participate effectively in hearings of this nature. Typically, participants use these funds to hire legal counsel and specialists with experience in conducting assessments of biophysical and socio-economic impacts, and to pay travel and accommodation expenses for representatives making presentations.

3.2.3 Presenters

Presenters are organizations or individuals who attended and spoke only at the formal hearings. Presenters were allowed 15 minutes each in which to present their views or information.

3.3 The Pre-Hearing

Following the filing of the EIS on September 22, 2015, the commission was issued its terms of reference for hearings into the MMTP on December 31, 2015. These terms of reference were revised on February 15, 2017. In October 2016, the commission invited Manitobans to apply for funds, under the Participant Assistance Program, to help them participate in the review of the project. The Participant Assistance Committee of the commission reviewed applications for funding and in December 2016, recommended to the Minister of Sustainable Development that allocations be made to organizations for their participation in the hearings. On the minister's concurrence, a total of \$500,000 was approved.

In order to prepare for public hearings into the project, participants were able to forward requests for clarification of information in the EIS, for background or pertinent information that had not been included in the EIS and technical reports. The proponent received and responded to 795 information requests, containing nearly 1,400 questions.

During this pre-hearing period, the commission held two pre-hearing meetings on January 17 and April 18, 2017. These meetings were held in order to discuss procedure, scheduling, and the terms of reference for the hearings. As well, during the pre-hearing phase of the process, Manitoba Hydro held a workshop with

participants and the panel on January 19, 2017, to provide an explanation of the process used to select the Final Preferred Route for the MMTP.

3.4 The Hearings

Hearings began on May 8, 2017, and ran until June 6, 2017, and were held in Winnipeg and La Broquerie. Throughout the hearings, the panel heard evidence and questions from 29 representatives speaking on behalf of the proponent, 35 representatives speaking on behalf of the participants, and 11 presenters speaking as private individuals. The panel also received 16 written submissions. See Appendix II for a full list of all those involved in the hearings.

Clean Environment Commission hearings follow a formal process. Written submissions and supporting materials are filed as exhibits. Witnesses for the proponent and the participants make oral presentations, in an agreed-upon order, summarizing their written submissions. Questioning of witnesses for the proponent or the participants proceeds formally and is conducted by the representatives of the proponent and the participants. Panel members also ask questions of the witnesses. All evidence presented to the panel is placed on the record and contributes to the panel's understanding of the matter. The commission's Process Guidelines Respecting Public Hearings can be viewed on the commission's website at www.cecmanitoba.ca.

3.5 Access to Information

Information presented to the commission during the hearings is available on the commission's website (www.cecmanitoba.ca). This includes background documents, presentations, verbatim transcripts of in-person submissions and written submissions.

Chapter Four

Manitoba's Electrical Generation and Transmission System

4.1 System Overview

Electricity in Manitoba is generated and transmitted by Manitoba Hydro, which operates a total of 17 generating stations, 15 of which are hydroelectric, and also buys electricity from two wind farms. Manitoba Hydro is currently building an 18th generating station, Keeyask, which was the subject of a Clean Environment Commission hearing in 2014 and was licensed under *The Environment Act* on July 5, 2014. Currently, the Crown corporation's generating capacity is approximately 5,000 megawatts (MW), which will be increased by another 695 MW once the Keeyask generating station becomes operational. This power is distributed to more than 550,000 domestic customers over approximately 18,500 kilometres of transmission lines and 68,100 kilometres of distribution lines, which are also built and operated by Manitoba Hydro.

Manitoba Hydro transmits electricity throughout Manitoba using two systems of power lines. Two high-voltage direct-current (HVDC) lines, called Bipole I and II, transmit electricity from the Lower Nelson River area, where most power generation occurs, to southern Manitoba, where most of the customers are located. These 500 kilovolt (kV) lines use direct current (DC) transmission because it is more efficient for carrying large loads of power over long

distances. Construction of a third Bipole line was licensed by Manitoba Sustainable Development in 2013, following Clean Environment Commission hearings in 2012-13. Its purpose is to provide reliability in the event of extreme weather or equipment failures and to carry electricity to be generated by Keeyask and any potential future generating stations. The Bipole III line is currently under construction. Manitoba Hydro's other lines transmit electricity in the form of alternating current (AC), which is the form in which electricity is generated and used in homes and workplaces. AC lines can be built to carry a wide range of voltages, including high-voltage lines of 500 kV, such as the existing transmission line that runs between Winnipeg and Minnesota (the Riel-Forbes line, formally known as M602F) to the east of the proposed MMTP. Other high-voltage transmission lines are typically 230, 138 or 115 kV. Lower-voltage distribution lines carry power to homes and businesses. Substations, with transformers for reducing the voltage of electricity, are located throughout Manitoba. Smaller transformers, often attached to distribution poles, reduce the voltage to the standard 120/240 voltage used in homes.

Manitoba Hydro has AC transmission lines connecting beyond the province to neighbouring provinces and states, which allow for surplus electricity to be sold for export and, in times of shortages, for

electricity to be purchased from other utilities. In Manitoba, the time of peak electrical demand is in winter, because of the need for heating. In many American states, the time of peak electrical demand is in summer, because of the demand for air conditioning. As a result, Manitoba has more surplus electricity to sell in the summer when customers in the United States need it more.

Manitoba Hydro's main existing international transmission line is the Riel-Forbes line, M602F, which went into service in 1979. It extends east from the Riel Converter Station along the Riel-Vivian Transmission Corridor (RVTC), then runs south-east to a border crossing point east of Sprague. There it connects to a transmission line that continues to a point near the town of Forbes in the Iron Range area of Minnesota. A second export-import transmission line is located within the MMTP Route Planning Area: a 230 kV line designated as R50M, which runs roughly parallel to the Riel-Forbes line. A small amount of the 230 kV international transmission line running from Glenboro

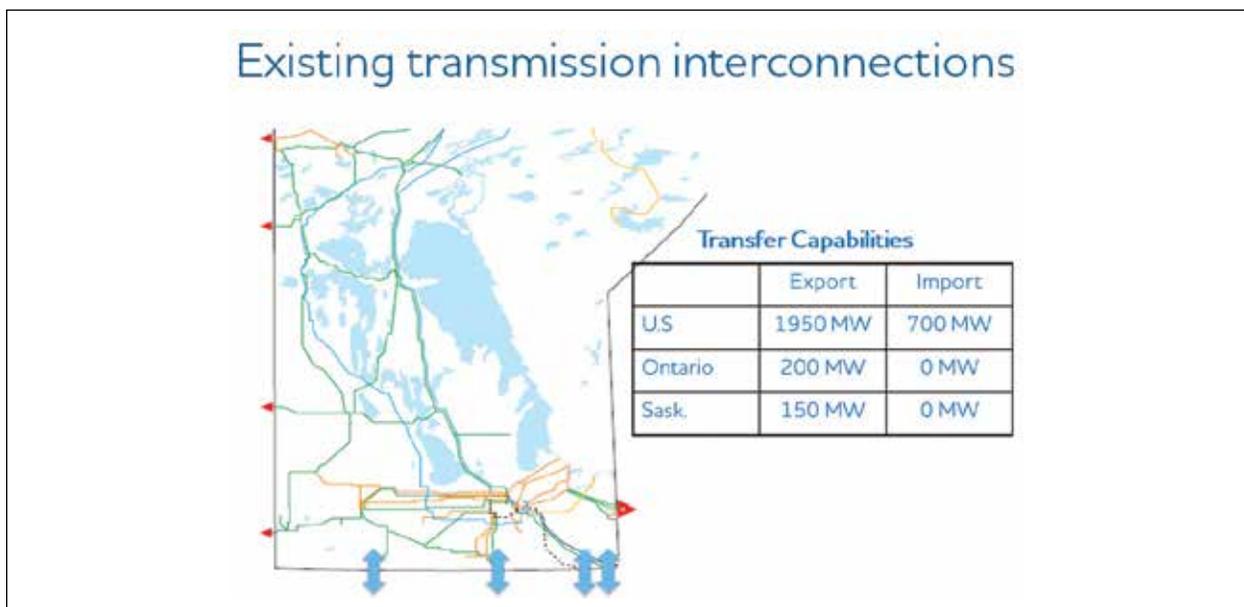
to Rugby, North Dakota, will be modified as part of the MMTP, as will the transmission station where this line terminates in Glenboro. A fourth international power line, which connects to the U.S. near Highway 75, is outside the MMTP area and will not be involved in the project. Manitoba also has interprovincial power lines that connect to the systems in Saskatchewan and Ontario.

4.2 Generating Stations

Most of Manitoba's Hydro's generating capacity is supplied by generating stations on the Nelson River, where the Kettle, Long Spruce, and Limestone stations have a total capacity of more than 3,500 MW. These three stations represent approximately 70 per cent of Manitoba Hydro's capacity. A smaller station, Kelsey, was the first on the Nelson River, built to supply the city of Thompson and surrounding nickel mines with electricity.

In order to keep these generating stations supplied with water throughout the

Fig. 4.1 – Manitoba Hydro's Transmission Network. Arrows at provincial borders indicate transmission interconnections. (Courtesy of Manitoba Hydro.)



year, Manitoba Hydro manages the flow of Manitoba's major river systems. Manitoba Hydro regulates water levels on Lake Winnipeg, using the Jenpeg Control Structure, and diverts water from the Churchill River into the Nelson, using control structures on the Churchill and Burntwood Rivers.

Manitoba has a long history of hydroelectric generation. The oldest generating station currently in operation in Manitoba is the Pointe de Bois station on the Winnipeg River, which went into service in 1911. It is one of six generating stations – with a total capacity of approximately 580 MW – on the Winnipeg River in Manitoba. In addition to generating stations on the Nelson and Winnipeg Rivers, Manitoba Hydro also owns the Grand Rapids Generating Station on the Saskatchewan River. It was built in the 1960s and has a capacity of approximately 480 MW.

In 2012, the Wuskwatim Generating Station on the Burntwood River, owned by the Wuskwatim Power Limited Partnership (a partnership of Manitoba Hydro and

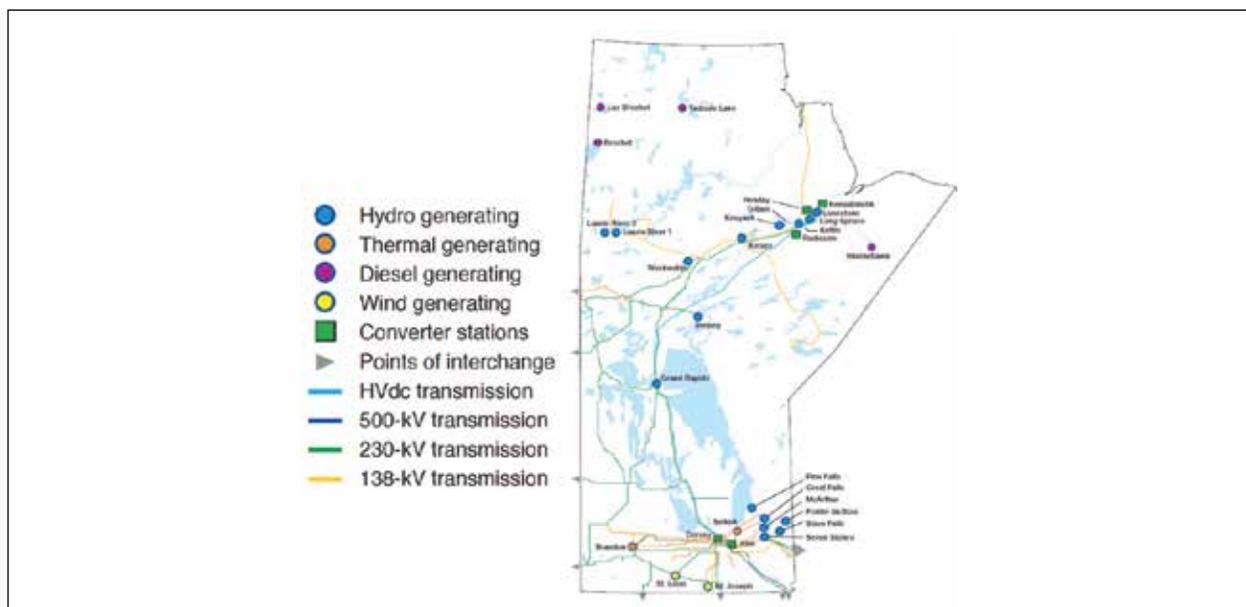
Nisichawayasihk Cree Nation), went into service, with a capacity of 200 MW. The Keeyask Generating Station is currently under construction on the Nelson River approximately 60 km downstream of Split Lake.

In addition to these hydroelectric generating stations, Manitoba Hydro operates thermal generating stations in Selkirk and Brandon that burn natural gas to generate a maximum of 458 MW of electricity when needed. As well, Manitoba Hydro purchases power from two independently owned windfarms, at St. Leon and St. Joseph, providing a maximum of nearly 240 MW of power.

4.3 Manitoba's Electrical Transmission System

Manitoba Hydro has a network of transmission stations and smaller distribution stations connected by 18,500 kilometres of transmission lines carrying voltages of

Fig. 4.2 Manitoba Hydro Power Generation Facilities. (Courtesy of Manitoba Hydro.)

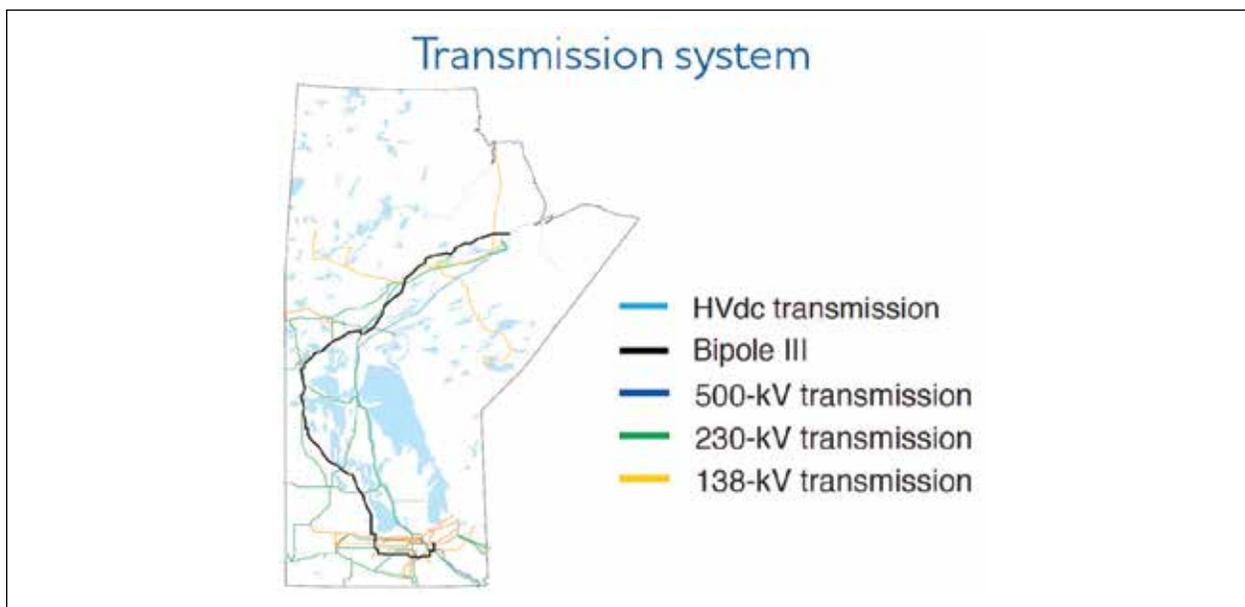


66, 115, 138 and 230 kV. Manitoba Hydro's system for transmission of electricity has been undergoing steady growth and upgrading along with the population and electrical consumption of Manitoba. Recent projects include:

- the St. Vital Transmission Complex, which consists of two 230 kV lines, both originating at the St. Vital Station, one running to the La Verendrye Station near Oak Bluff and the other running south to Letellier,
- the Lake Winnipeg East System Improvement Project, consisting of a 115 kV line connecting the Pine Falls Station with Manigotagan Station, and
- the Riel Terminal Station, completed in 2014 east of Winnipeg to provide a new end point for the existing international power line known as Riel Forbes or M602F (previously it terminated at the Dorsey Converter Station) and for Bipole III.

As part of its efforts to upgrade transmission capability, Manitoba Hydro has been developing a dedicated transmission corridor to connect the Dorsey, La Verendrye and Riel stations, running west and south of Winnipeg. This corridor is known as the Southern Loop Transmission Corridor. In addition to high-voltage transmission lines and major stations, Manitoba Hydro has approximately 68,100 kilometres of distribution lines and almost 400 distribution stations in Manitoba, 97 of them in Winnipeg.

Fig. 4.3: Manitoba Hydro's Transmission System. (Courtesy of Manitoba Hydro.)



Chapter Five

The Manitoba-Minnesota Transmission Project

5.1 Overview

The Manitoba-Minnesota Transmission Project (the MMTP or the project) will increase Manitoba's capacity for export of electricity for sale to Minnesota Power and for import of electricity in the event of a drought or malfunction that affects Manitoba Hydro's operations. The new line will increase export capacity by 883 megawatts (MW), to about 3,200 MW. It will increase import capacity by 700 MW, to 1,400 MW.

The largest component of the project is the 213 km transmission line – referred to by Manitoba Hydro as D6041 – which will run from the Dorsey Converter Station to the Manitoba-Minnesota border near the community of Piney. Approximately 82 km of the line will travel through existing transmission corridors adjacent to other transmission lines. It will travel through a new right-of-way (ROW) for approximately 121 km. The project also includes modifications to three Manitoba Hydro stations: Dorsey, Riel and Glenboro South.

Planning for the project began in 2007 and engineering planning studies began in 2008 to define options for transmitting electricity to the U.S. A system-planning report that included the project and other developments as part of Manitoba Hydro's electrical generation and transmission system

was begun in 2010 and completed in 2015. An introductory conference call with Minnesota Power in July 2012 began the process of determining a route for the new transmission line.

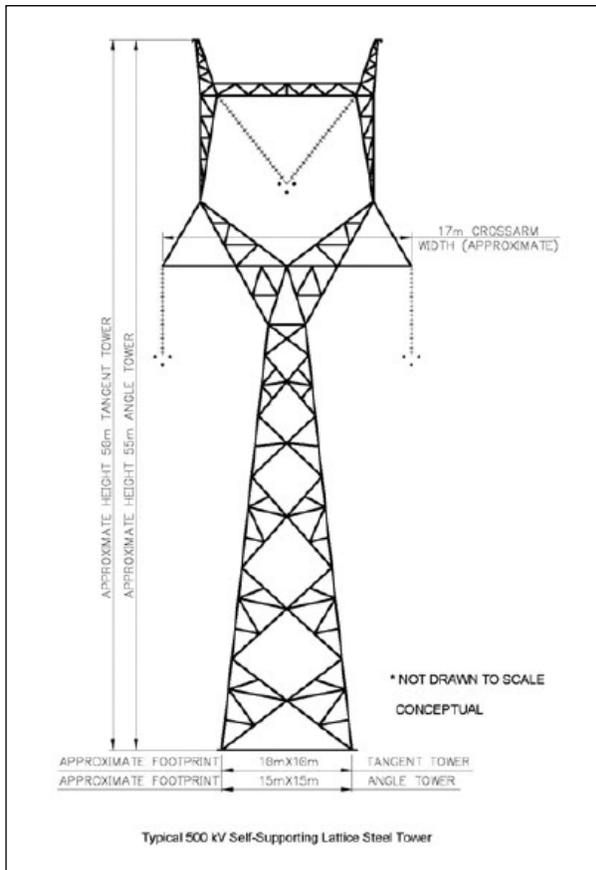
5.1.1 Transmission Line

The transmission line is actually a collection of nine wires – called conductors – arranged in bundles of three, through which the electricity will flow. These conductors will be held up by approximately 525 steel lattice towers. In addition to these conductors, the towers will hold up wires referred to as “skywires,” which are placed above the conductors and run along the tops of the towers to provide lightning protection. One of these wires is referred to as the optical protection ground wire; it carries communications signals for the control and protection of the transmission line.

Beginning at the Dorsey Converter Station, the transmission line will be built within a cleared ROW that will be 80 to 100 metres wide. Transmission line ROWs are cleared and maintained to be free of tall vegetation that could pose the risk of interfering with the conductors. ROW width is governed by the amount that the lines can be blown to the side in strong winds, a phenomenon known as “conductor

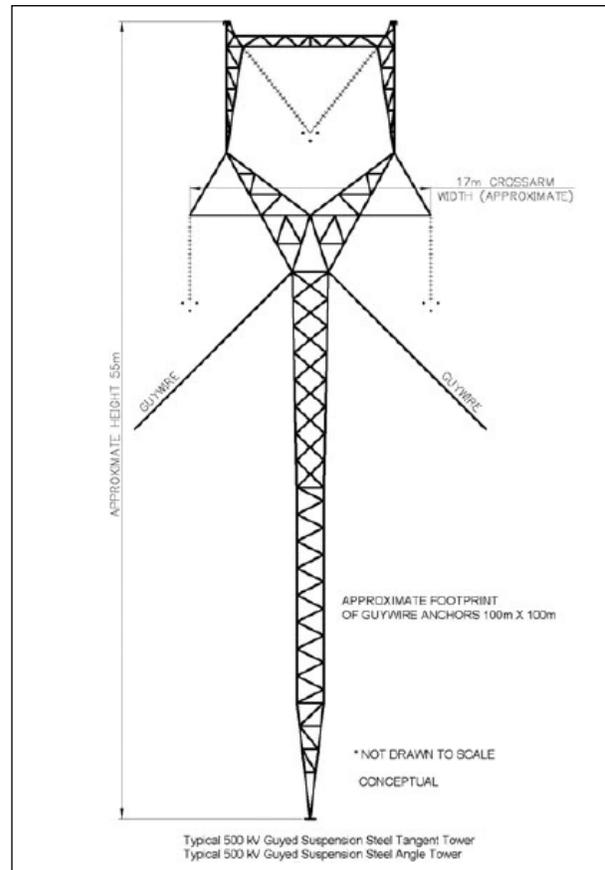
blowout.” Conductor blowout is largely determined by the distance between towers, so that towers closer together have less conductor blowout than towers spaced far apart. The line will be carried by steel lattice towers that will be approximately 50-55 metres high, with a cross arm that supports two bundles of conductor wires and a central “window” above that supports a third. The cross arms will be 16.7 metres wide (nearly four metres wider than those of the existing 500 kV transmission line from Riel to Forbes), which will create enough distance between the conductors to allow Manitoba Hydro to carry out live line maintenance. Live line maintenance allows work to be carried out on one part of the line without shutting off power to the entire transmission line.

Fig. 5.1: Self-Supporting Tower. (Courtesy of Manitoba Hydro.)



A variety of tower designs will be used. Towers crossing agricultural land will be self-supporting (see Fig. 5.1). Those crossing non-agricultural land will be supported by guywires (see Fig. 5.2). Self-supporting towers located at points where the line changes direction, known as angle towers, are wider and more heavily supported in order to accommodate the greater forces exerted on them as a result of the angle. Self-supporting towers will also be designed to be non-cascading, which means that if one tower falls for any reason it will not bring down the adjacent towers. Manitoba Hydro states that self-supporting sections of the transmission line will require an 80-metre ROW, whereas those with guywires will require a 100-metre ROW, to accommodate the anchor points for the wires. Towers will be spaced approximately 400 to 500 metres apart.

Fig. 5.2: Guyed Tower. (Courtesy of Manitoba Hydro.)



The physical footprint of the towers themselves varies depending on the nature of the tower. Self-supporting towers have a base of 10 metres by 10 metres, or 15 metres by 15 metres for the larger towers used at angles. Guyed towers touch the ground only at one small point, but are considered to have a footprint of 100 metres by 100 metres to account for the area within the anchor points of the four wires.

For approximately the first 82 kilometres after exiting the Dorsey Station, the transmission line will follow two existing transmission corridors on land that has been purchased by Manitoba Hydro or for which Manitoba Hydro has obtained easements to run lines over private land. The great majority of this land is used for agriculture and only a small amount of it is forested or wetlands. (See Fig. 1.1 Manitoba-Minnesota Transmission Project Components.)

For the first 58 kilometres, the line will be located within the Southern Loop Transmission Corridor (SLTC), which circles Winnipeg just beyond city limits. The SLTC is up to 245 metres wide and is designed to accommodate multiple transmission lines for future energy demands in southern Manitoba. The SLTC currently has two 230 kV AC lines within portions of its length and has the potential to house more. The MMTP will follow the SLTC south, crossing the Assiniboine River just west of Headingley, then veer east, crossing the LaSalle River and the Red River just south of St. Norbert. It will continue to the east, running parallel to the Red River Floodway, then turn north along the floodway to the Riel Converter Station, at which point the transmission line will leave the SLTC.

After exiting the SLTC, the MMTP will enter another existing utility corridor, the Riel-Vivian Transmission Corridor (RVTC). This corridor runs due east from the Riel station to Vivian, Manitoba. It is currently

177 metres wide and contains the existing 500 kV AC Riel-Forbes transmission line, which is Manitoba Hydro's main international transmission line connecting to the United States. Bipole III also uses a portion of the RVTC. Locating the MMTP within the RVTC will require modifications to the existing Riel-Forbes line. In order to prevent one of the two 500 kV lines from crossing over the other, which would present reliability risks in the event of a line failure or extreme weather-related event, the Riel-Forbes line will be moved onto new towers to be built within the corridor. The MMTP will then use the towers currently used by the Riel-Forbes line for 24 kilometres from Riel to PTH 12.

After the proposed line exits the RVTC south of Anola, it will proceed southeast within a new ROW for 121 kilometres to the U.S. border near Piney. This portion of the proposed transmission line ROW traverses both privately owned and Crown land and includes land used for annual crops, pasture, forests and wetlands. In agricultural areas, the proposed line will use self-supporting towers in order to limit the impact on agricultural activities that would be caused by guywires. In non-agricultural areas, the line will use guyed structures, reducing the cost of construction and materials and providing for greater tower stability in places of saturated soils, such as wetlands.

5.1.2 Modifications to Stations

The project requires modifications to the Dorsey and Riel Converter Stations and to the Glenboro South Station, two of which will require expansion onto adjacent land.

Construction on the Dorsey Converter Station began in 1968 to create the southern termination point for Bipole I and later for Bipole II. The MMTP will join with Manitoba

Hydro's distribution system at Dorsey. Additional circuit breakers and reactors are needed to allow the MMTP to terminate at the station. Reactors are safety mechanisms that reduce the voltage of the incoming line in the event that a breaker is open in the station. To accommodate the new equipment, the station will be expanded by just over 1.5 hectares. The expansion is on property owned by Manitoba Hydro.

The Riel Converter Station is a relatively new development on the east side of Winnipeg. The Riel Terminal Station was completed in 2014 as part of Manitoba Hydro's Riel Reliability Improvement Initiative and the Riel Converter Station is the southern terminus of the Bipole III Transmission Project. (The Bipole lines terminate at different locations for reliability reasons, so that it would be less likely that a disaster like an ice storm, tornado or extreme wind could damage both Bipole III and the two older Bipole lines.) Although changes will be required at Riel related to the MMTP, no additional land is required.

The Glenboro South Station is located 1.5 km south of the junction of PTH 2 and PTH 5 near the community of Glenboro. It provides the termination point for a 230 kV AC international transmission line leading to Rugby, North Dakota. The creation of the MMTP linking Dorsey with the Iron Range station in northeast Minnesota will cause additional flows of energy back into lines in western Manitoba. New equipment will be needed at Glenboro to manage this and prevent congestion on the line. To accommodate this new equipment, the Glenboro station will be expanded by approximately 1.2 hectares on property owned by Manitoba Hydro. Modifications to three existing transmission lines will also be required near the station.

5.2 Timeline and Workforce

At the time of the preparation of the environmental impact statement (EIS), Manitoba Hydro expected work to begin on the various components in the summer of 2017 and to continue until late 2019, with commissioning of the new line in 2020. The revised schedule, presented at the hearing, assumes a January 2018 start and March 2020 completion, although timing will depend on decisions of the National Energy Board. The project is being split in two for contracting purposes. One section consists of the existing ROW, running from the Dorsey Converter Station to a point near Anola on the RVTC. The other consists of the new ROW, running from the RVTC to the Manitoba-Minnesota border.

During construction of SLTC portions of the line, Manitoba Hydro expects the workforce to peak at approximately 70 contractor employees, plus 10 Manitoba Hydro employees on site. During construction of the portion of line from Riel to the border, numbers would peak at 80 contractor employees and 15 Manitoba Hydro employees. Realignment of the lines at Glenboro South Station is expected to require a peak of 15 contractor employees and 15 Manitoba Hydro employees.

Work on the Dorsey Converter Station is planned to last for approximately two years, and will largely be carried out by Manitoba Hydro employees, peaking at 27. Work at the Riel Converter Station is also expected to take about two years, with approximately 55 contractor employees and 11 Manitoba Hydro employees involved. The work at Glenboro South Station is planned for spring and summer of 2019, and will involve 15 contractor employees and 15 Manitoba Hydro employees.

Manitoba Hydro has developed contracting strategies in consultation with

First Nations and the Manitoba Metis Federation to set minimum mandatory targets for employment, subcontracting, training and other opportunities for Indigenous people. This approach led to a labour force for three specific contracts on the Bipole III project in the winter of 2017 that was 70 per cent Indigenous. In part, this was a result of training Manitoba Hydro carried out for tower assembly workers, which led to 87 individuals hired for an average of 98 days each on Bipole III.

What We Heard – Project Design

Some participants expressed concern about the design of the project, especially regarding design choices that influenced the amount of clearing needed for the ROW and the visual impact of the transmission line.

One participant noted that the Bipole III 500 kV DC line requires only a 66-metre ROW and that the existing M602F 500 kV AC line running from Riel to Forbes requires a 76-metre ROW. This participant also argued that 500 kV AC lines in other provinces in Canada typically require ROWs of 50 metres width and that the transmission line the MMTP connects with, the Great Northern Transmission Line in Minnesota, will have a 61-metre ROW, with 91 metres cleared around the towers.

The panel heard an expert witness for another participant group who argued for different tower designs that could reduce the visual impact of the transmission line. According to this witness, a monopole design would be less visually obtrusive than the steel lattice towers planned by Manitoba Hydro. The panel heard that some countries in Europe are moving away from lattice towers entirely in order to make transmission lines less visually obstructive. Monopole towers also have a much smaller footprint, so they take

less agricultural land out of production. Given that conductor blowout is a factor of how far apart towers are, this witness argued that the transmission line could be designed with shorter towers, but with the towers spaced more closely together. Doing so would allow for a narrower cleared ROW and make the towers themselves less visible.

In response to this concern, Manitoba Hydro argued that placing towers closer together would create more obstacles for farmers to manoeuvre around and increase the cost of construction. As well, steel lattice towers can be climbed by maintenance workers. With monopole towers, the only way to get access to the line for repairs would be to use a heavy-duty bucket truck, which would both increase the cost and the potential environmental effect of maintenance work (the latter because of the need to drive a large truck up and down the ROW during repairs). Manitoba Hydro also argued that the width of the ROW was in part a function of the reliability requirements for the line. The towers are designed with longer cross arms so that it will be possible to carry out live line maintenance, and this added to the required width. Manitoba Hydro later clarified that in the portions of the line using guyed towers, it may not be necessary to clear the entire 100-metre ROW. The full width will need to be cleared in the area of the towers, to make room for the guywire anchors, but between the towers Manitoba Hydro can consider reducing the cleared area to 80 metres.



Chapter Six

Public, First Nations and Metis Engagement

6.1 Requirements and Guidelines for Engagement

In developing engagement processes for the project, Manitoba Hydro considered guidelines contained in the *Canadian Environmental Assessment Act, 2012*, *The Environment Act* (Manitoba), and the National Energy Board Electricity Filing Manual. Manitoba Hydro's engagement activities are also guided by the values and best practices of professional organizations, including the International Association for Public Participation and the International Association for Impact Assessment. Among these values and best practices are that people and communities potentially affected by a project or activity have the right to be involved in the decision-making process. The scoping document for the environmental impact statement (EIS) also included guidelines for public, First Nations and Metis engagement.

The scoping document set out goals for public engagement, including sharing information, obtaining feedback on route selection and environmental impacts, gathering local concerns, integrating concerns into the route-selection process, reviewing mitigation measures and gathering suggestions for changes to mitigation. Methods of achieving these goals were to include: involving the public through the route selection and environmental assessment

process; providing clear, timely and relevant information; inclusivity and adaptability; informing the public how their feedback has influenced the project; and documenting feedback. The scoping document specified a three-round process of public engagement.

For First Nations and Metis engagement, the scoping document specified that engagement processes would have the same goals as the public process described above. Manitoba Hydro's First Nations and Metis engagement process is separate from the Crown-Aboriginal consultation process carried out in accordance with Section 35 of the *Constitution Act*. That consultation process is carried out by government.

First Nations and Metis engagement for the project was to include the Manitoba Metis Federation (MMF) and First Nations in the vicinity of the project or that have expressed an interest in the project. Methods of engagement were to be adaptive and dependent on the response and interest of the parties involved. First Nations and Metis engagement included studies of traditional land and resource use, with First Nations and the MMF invited to submit proposals for self-directed Aboriginal traditional knowledge (ATK) studies. Traditional knowledge shared prior to completion of the EIS was to be incorporated into and reflected in the assessment. Traditional knowledge shared with Manitoba Hydro after the completion of the EIS is to be incorporated

into the Environmental Protection Plan (EPP) for the project, where appropriate.

Both the Public Engagement Process (PEP) and the First Nations and Metis Engagement Process (FNMEP) were intended to engage individuals living in or with an interest in the Project Study Area, a large area of southeastern Manitoba bounded on the north by the Riel-Vivian Transmission Corridor (RVTC), on the south by the U.S. border, on the west by a line just to the west of PTH 59 and on the east by a line approximately 20 km east of the existing Riel-Forbes Transmission Line.

Development of the engagement process for MMTP was informed by the Clean Environment Commission report on Manitoba Hydro's application for an *Environment Act* Licence for the Bipole III Transmission Project. In that report, the commission issued a non-licensing recommendation that Manitoba Hydro improve its consultation (now referred to as engagement) processes by seeking input from experts in the field of participatory consultation processes, as well as representatives of Indigenous organizations. The commission also made licensing recommendations in the Bipole III report concerning consultation with landowners, including that Manitoba Hydro consult with landowners to ensure the routing and tower placement have the least possible impact on agricultural operations. A related licensing recommendation in that report cited some specific concerns of landowners regarding routing and tower placement and recommended that Manitoba Hydro consult with landowners to determine if they would prefer the transmission line to be located along the half-mile line (the dividing line between quarter sections).

In its overall comments on engagement in the Bipole III process, the commission observed that effective processes provide information that is comprehensive but not overwhelming, employ a rational methodology, fairly summarize technical

details and ATK, involve people with an interest early in the process, are inclusive of different views and communities, integrate different kinds of knowledge, are goal-oriented and are respectful in all interactions. In keeping with this overall vision of engagement, the commission urged that ATK be part of a project EIS, rather than something that is incorporated late in the process. Referring specifically to issues in agricultural regions of the Bipole III project area, the commission commented that personal consultation with landowners whose property would be directly affected by the transmission line was essential.

A plain-language document summarizing the EIS and describing the project and its planning, potential effects, mitigation, protection and monitoring programs was produced for distribution during the engagement programs. As well, plain-language documents were provided describing the route-selection process, electrical and magnetic fields, clearing and maintenance of the ROW and other subjects of interest.

Aboriginal Traditional Knowledge

Aboriginal traditional knowledge (ATK) is knowledge that is held by and unique to Aboriginal people. It is a living body of knowledge that is cumulative and dynamic and adapted over time to reflect changes in the social, economic, environmental, spiritual and political spheres of Aboriginal knowledge holders. While an ATK study may include many such areas of knowledge, a traditional land and resource use study is usually more focused on use of a specific area and its resources and may take the form of identification of specific areas used for hunting, fishing, trapping and plant harvesting.

6.2 Public Engagement Process

Manitoba Hydro's Public Engagement Process began in June 2013, two years before the regulatory filing for the project. Over the course of the PEP, Manitoba Hydro met with more than 1,500 people at public open houses and a series of one-on-one meetings with landowners, held numerous meetings and workshops with stakeholder groups and landowners and responded to more than 850 telephone calls and emails.

The PEP was intended to share information, obtain feedback for use in environmental assessment and route selection, gather local concerns, integrate those concerns into the environmental assessment process and review mitigation measures. Manitoba Hydro's goals for the process were to ensure that it was inclusive, adaptive, comprehensive, and responsive. The PEP consisted of three main rounds of meetings and workshops. It began in the summer of 2013 with a pre-engagement process to initiate dialogue, gather feedback on preferred methods of engagement and identify stakeholder groups. In order to begin dialogue and spread awareness of the project, Manitoba Hydro contacted more than 100 organizations, including agricultural, recreational and environmental groups and government agencies, at the beginning of the PEP. More than 25,000 postcards were also sent out at this stage. In Round One, in October-November 2013, alternative routes and proposed border crossings for the MMTP were presented and concerns were identified. In Round Two, from April to August 2014, Manitoba Hydro presented revised alternative routes and the preferred border crossing, as well as a summary of what was heard in the first round. Public input in the second round was used to identify concerns and guide further route-selection decisions. An additional series of public meetings was held

in October and November 2014 to present the modified border crossing location of Piney West determined by Manitoba Hydro and Minnesota Power. Round Three of the PEP was carried out from January 2015 to the regulatory filing in the autumn of that year. In this round, Manitoba Hydro presented the preferred route and what was heard in the earlier rounds. In addition to identifying concerns, this round included discussion of potential effects and mitigation measures.

Manitoba Hydro identified specific organizations for engagement, including provincial government departments, local governments, conservation districts, groups involved in previous hearings, recreation organizations, agricultural organizations, environmental non-governmental organizations (NGOs) and other groups with a potential interest. The process also included many different approaches for reaching and hearing from individual members of the public.

Advertising for the engagement process was carried out in daily and weekly newspapers in Winnipeg and southeast Manitoba, as well as specific-demographic newspapers including Grassroots News, the Manitoba Cooperator and La Libert . Postcards were sent to addresses in Winnipeg, Steinbach, Ste. Anne and 13 rural municipalities located in the project area. A project website, press releases, emails, a project video series, posters, social media and telephone calls were used to convey information and alert the public to opportunities to have input.

Open houses were held in Headingley, Oak Bluff, Winnipeg, Ste. Anne, Lorette, Dugald, Anola, Zhoda, La Broquerie, Marchand, Piney, Vita, Richer, Ile des Chenes and Steinbach. One-on-one meetings were held with potentially affected landowners, located within one mile of the preferred route, at temporary

meeting locations known as landowner information centres. These meetings were held at the locations of the open houses. Comment sheets were gathered at open houses in each of the three rounds. In Round One, comment sheets were used to gather public perspectives on criteria to be used in the route-selection process. In Round Two, comment sheets were used to gather perspectives on public concerns about the valued components to be assessed and public information about concerns related to the alternative route segments. In Round Three, comment sheets were used to gather information about land uses and concerns related to the preferred route as well as to give the public an opportunity to comment on mitigation measures.

Comments were categorized by topic and entered into a database of public concerns so that they could inform the route-selection process. Twenty-two categories of concerns, including agriculture, property and residential development, wildlife, access, and the Public Engagement Process itself, were generated.

Manitoba Hydro developed a questionnaire for landowners, with questions on property, residence, land and resource use, heritage resources and several aspects of the biophysical environment. This questionnaire was used to gather information from 141 potentially affected landowners and 2,144 landowners within one mile of the transmission line. Feedback was compiled and characterized into more than 20 categories, including physical environment, aquatics, traditional land use, agricultural land use and property values. During the PEP, Manitoba Hydro assigned each landowner whose property would be crossed by the transmission line a specific engagement staff member (out of group of six) who would be a regular contact person and provide continuity and familiarity.

Themes in the public concerns gathered through these processes included effects on health and safety, residential development,

property value, “bush/swamp land” (i.e. a preference indicated for locating the line on non-agricultural land), private lands, increased access by hunters or all-terrain vehicle users, effects on agriculture and effects on protected areas.

Participants in the PEP provided feedback on route alternatives in a process that will be described in greater detail in Chapter Seven: Route Selection.

6.2.1 Influence of the PEP on the Project

In addition to influencing the scores assigned to various routing options in the route-selection process (described in Chapter Seven: Route Selection), information gathered through the PEP led to a number of specific alterations in the Final Preferred Route.

One such alteration was near the Ridgeland Cemetery, south of PTH 12 in the Rural Municipality of Stuartburn. Local residents told Manitoba Hydro that they participate in a religious tradition at the cemetery. Both to preserve the appearance of the cemetery and its character for hosting the event, they wanted more separation between the transmission line and the site. In response to this concern, the location of the line was moved a short distance and the tower design was changed from guyed (which require a 100-metre ROW) to self-supporting (which require an 80-metre ROW) to ensure more trees to block the view of the line. As well, Manitoba Hydro had a survey conducted to ensure that there were no burials outside of the boundary of the cemetery that could be affected by construction of the line.

Other examples cited in the EIS refer to changes to accommodate the development plans of landowners. In one case in the Rural Municipality of Taché, Manitoba Hydro staff

were informed that the proposed placement of the line in one quarter section of land would place it overtop of two planned home sites. The line in this case was modified to follow the eastern boundary of the property. In another case near Richer, Manitoba Hydro learned of a 42-lot subdivision planned in three phases. Following discussions, the preferred route was modified to parallel an existing 230 kV line further east.

6.3 First Nations and Metis Engagement

Manitoba Hydro's First Nations and Metis Engagement Process began in August 2013 and included leadership meetings, open houses, field visits, letters, telephone calls and self-directed studies. Eleven First Nations, the Manitoba Metis Federation (MMF) and four Indigenous organizations were involved in the three rounds of the process and the pre-engagement communications. Manitoba Hydro chose to contact First Nations and Indigenous organizations that had expressed interest in the project, were signatories to Treaty One, are located within Treaty One territory, are located within 40 kilometres of the study area or have a mandate related to the project area.

In Round One, from September 2013 to April 2014, First Nations, the MMF and Indigenous organizations had the opportunity to provide feedback on alternative routes and border-crossing points and on concerns about the Route Planning Area. In this round, 19 leadership meetings, open houses and information sessions were held.

In Round Two, from April to August 2014, Manitoba Hydro presented the preferred border crossing and alternative routes for discussion of concerns and perspectives. Forty-three leadership meetings, open houses, information sessions and workshops were

held in this round. After Round Two, when the planned border crossing was modified as a result of discussions between Manitoba Hydro and Minnesota Power, additional information was provided to First Nations, the MMF and Indigenous organizations.

In Round Three, from January 2015 to the filing of the EIS later that year, Manitoba Hydro presented its preferred route and gathered feedback on final adjustments. This round included 28 leadership meetings, community open houses, information sessions, workshops and field visits. Engagement with First Nations and Metis has continued since the filing of the EIS in September 2015. Environmental Protection Plan meetings began in January 2016 and have continued. In November 2016, the first community monitoring meeting was held, followed by a second community monitoring meeting in March 2017.

In addition to workshops and meetings, the FNMEP also included a number of tours to investigate alternative routes and potentially sensitive areas near the preferred route. Manitoba Hydro organized a field tour with the Aboriginal Traditional Knowledge Study Management Team (representing Black River First Nation, Long Plain First Nation and Swan Lake First Nation) in the fall of 2014. In the spring of 2015, Manitoba Hydro organized a tour of the preferred route and the Dorsey and Riel Converter Stations for Dakota Tipi First Nation. In summer of 2015, Manitoba Hydro organized a tour for Sagkeeng First Nation that included parts of the preferred route, the Riel Converter Station, sections of the adjacent D602F transmission line ROW and areas near the Watson P. Davidson Wildlife Management Area (WMA). Roseau River Anishinabe First Nation also conducted a field visit during the summer of 2015, which included a visit to an area of privately owned land near the preferred route that is used for collecting medicinal plants.

Throughout this period of the FNMEP, a number of ATK or traditional land and resource use studies were discussed or carried out by individual First Nations, First Nations working together and the MMF. In some cases, discussion of these studies began as early as the pre-engagement communication in August 2013. In many other cases, discussions regarding ATK began during Round One or Round Two. By Round Three, drafts of some studies had been completed. As of August 2015, the status of the studies was:

- ATKS Management Team, involving Black River First Nation, Long Plain First Nation and Swan Lake First Nation, submitted in May 2015;
- Dakota Plains Wahpeton First Nation, described as “pending” as of August 2015;
- Dakota Tipi First Nation, begun in August 2015;
- Manitoba Metis Federation, in discussion as of August 2015;
- Peguis First Nation traditional land and resource use study, submitted in June 2015;
- Roseau River Anishinabe First Nation, submitted in July 2015; and
- Sagkeeng First Nation, begun in February 2015.

ATK studies by Dakota Plains Wahpeton, Dakota Tipi and Sagkeeng First Nations were received in 2016. The MMF submitted a traditional land and resource use study in 2017.

In addition to individual First Nations, Manitoba Hydro invited the Aboriginal Chamber of Commerce, Assembly of Manitoba Chiefs, Dakota Ojibway Tribal Council and Southern Chiefs Organization to

respond with any questions or concerns about the project.

Nine of the First Nations involved with the project were offered funding by Manitoba Hydro for part-time community coordinators to assist in keeping the leadership informed, maintaining contact with Manitoba Hydro, planning and organizing participation and other needs. Two of the First Nations already had funding from Manitoba Hydro for community coordinators as a result of other projects. Manitoba Hydro also funds a liaison officer at the MMF.

6.3.1 Influence of FNMEP Feedback on the Project

Most of the First Nations involved in the project indicated concerns about route alternatives in the eastern portion of the study area. These alternatives – to the east of Marchand and the Watson P. Davidson WMA – would traverse more Crown land than those in the western portion of the study area. Concerns about routing in this area focused on potential effects on wildlife, vegetation and habitat, on reduction in the amount of Crown land available in the area for resource harvesting and on potential effects on Crown land available for the treaty land entitlement process. A preference was expressed for a route through land that had already been modified or cleared. The proposed Final Preferred Route (FPR) traverses to the west of Marchand and the Watson P. Davidson WMA.

Several of the ATK or traditional land and resource use studies discussed heritage sites and the potential for burials that could be disturbed by project construction. Several of the studies also discussed the presence of rare plants and traditionally harvested plants that could be disturbed by construction and maintenance. In the numerical models used for comparing

alternative routes, described in Chapter Seven: Route Selection, these concerns influenced the scores assigned to routes that would travel through the less disturbed eastern portions of the planning area. As well, these concerns and the information on these subjects will be incorporated into the Environmental Protection Program (EPP), Access Management Plan, Cultural and Heritage Resources Protection Plan and other plans for the project. Some of the participating First Nations have provided feedback about sensitive botanical sites and areas where archaeological sites or burial sites may be present, and this will be incorporated into the EPP.

The identification of moose as a species of concern in the ATK studies helped to inform the selection of moose as one of the focal species in the assessment of the project's potential effects on wildlife.

One specific concern was expressed about an area of land near the community of Sundown that is used for cultural purposes and this led to a modification to the preferred route. Another modification was made to the route in the Piney area in response to concerns raised through the FNMEP.

What We Heard – Engagement

A common concern among several participants was that both the PEP and the FNMEP began after project planning had begun. Key decisions about the criteria to be used in the route-planning process and the weightings to be attached to these criteria were made by Manitoba Hydro staff before any input could be gathered from either engagement process. It was noted that the initial planning of the MMTP began in 2007, but the FNMEP did not begin until August 2013. Manitoba Hydro responded by stating that the early planning of the project was at

the conceptual stage, with the destination of an import-export transmission line not yet known and the likely location not yet certain. Manitoba Hydro staff indicated that in the past they have learned that communities prefer to be engaged regarding specific projects, rather than regarding open-ended concepts and large, undefined areas.

Some participants expressed the concern that with the FNMEP beginning in August 2013 and the EIS being submitted in September 2015 there was not sufficient time to carry out ATK or traditional land and resource use studies that could be incorporated into the EIS. While some of the studies were completed in time to be incorporated into the EIS, many arrived after the EIS was filed and will be used in development of the Environmental Protection Plan. Participants asked Manitoba Hydro about a non-licensing recommendation from the Clean Environment Commission's Bipole III report that asked the Manitoba Government, with Manitoba Hydro, to investigate the feasibility of developing an ATK or traditional land use database that could be used in the assessment of future projects. In response, Manitoba Hydro stated that it understands that many Indigenous communities have concerns about sharing their knowledge over a broad region. As well, Manitoba Hydro prefers to work with communities on a project-by-project basis, given that each project is unique in terms of nature, scope, scale and location and so may require unique information. Nevertheless, it appears, from evidence at the hearings, that little has been done by either Manitoba Hydro or the province to advance the development of a traditional land use data base.

Some First Nations participants made the point that, in the early stages of planning for engagement, proponents should not limit their contacts to First Nations in proximity to the study area. First Nations members often travel long distances to engage in traditional uses. In

the case of the MMTP, it traverses areas that may be used by First Nations people who live in Winnipeg but are members of First Nations from other regions. For Manitoba Hydro to contact First Nations that are located in Treaty One territory or that were signatories to Treaty One, it was argued, made proximity a *de facto* criterion for involvement in engagement.

The panel heard several individual presenters make reference to a computer-animated video produced by Manitoba Hydro. The video was intended to depict the MMTP from the Dorsey Converter Station to the Minnesota border. The video showed where the line changes direction, crosses major rivers and travels through existing rights-of-way (ROWs) and where it will require new ROWs. A number of presenters were concerned that the video did not show the specific details of the area through which the line travels and did not depict houses and other buildings located adjacent to the route.

Several presenters told the panel that when they examined tentative plans for the MMTP route during open houses or other engagement events it appeared that Manitoba Hydro's maps or aerial photos were out of date. Presenters said their homes or farm buildings were not included in the maps and aerial photos.

In response to a question from the panel, Manitoba Hydro provided a draft communication plan for construction and operations of the project. The draft plan committed Manitoba Hydro to continuing many of its engagement activities from the PEP and the FNMEP. Manitoba Hydro will continue to update its website with information about the project and will continue to communicate with rural municipalities, First Nations, Indigenous organizations, the MMF, landowners, stakeholder groups and individuals who signed up for email notices during the engagement processes. Communications

will inform interested parties about the provincial and NEB regulatory decisions, construction, completion of the project, and ongoing operational steps. Notices will be sent regarding ROW safety and any access restrictions during construction. Local newspaper ads will be used to notify the public of noteworthy construction activities. Draft plans such as the Access Management and Construction Environmental Protection Plans will be made available through the project website. Monitoring reports will be posted on the website and sent to First Nations and the MMF.

Commission Comment – Engagement

Manitoba Hydro's engagement efforts for the MMTP represent a positive step by the corporation since the Bipole III Transmission Project. These activities appear to be benefiting from the guidance of the values and practices of the International Association for Public Participation and International Association for Impact Assessment. Manitoba Hydro's efforts to engage First Nations and Metis people also appear to have been met by some positive response, judging by some of the generally supportive remarks made during the hearings, in which First Nations participants supported the corporation's selection of a route west of the Watson P. Davidson WMA.

One example of a beneficial result of the engagement process in this project was the series of field trips for First Nations elders, youth and resource users. The information brought forward through these proved the value of early and well-resourced engagement.

That said, the concerns about the need for early engagement are valid. It appears that many important decisions about the route-planning process, such as development of routing factors and the weightings for

the various factors, were made before the engagement processes had begun. The lack of Indigenous representation at the first workshop (which developed criteria and weightings to be used in developing routes) led to the non-inclusion of specifically Indigenous issues in the early models used in the route-selection process.

Regarding the concern that there was insufficient time to prepare ATK or traditional land and resource use studies prior to completion of the EIS, the panel continues to see the benefits of a non-licensing recommendation made by the Clean Environment Commission in the Bipole III report that asked the Manitoba Government, with Manitoba Hydro, to investigate the feasibility of developing an ATK database that could be used in the assessment of future projects. Based on information presented at the hearing, it appears neither party has begun discussion on this matter. If such a database existed, traditional knowledge and land use could be collected once and occasionally refreshed, but might not need to be gathered for every project by every private or public proponent. Creation of such a database would also help to ensure that knowledge of current elders is not lost. Many sites of significance are likely held only in memory and therefore identifying and mapping such sites prevents them from being forgotten (and potentially impacted). Such an endeavor would require co-operation on the part of the Crown and Indigenous peoples and to a lesser extent individual proponents. The information could be held by a mutually agreed upon third party with conditions on how data would be released. The commission notes that Ontario embarked on such an exercise as part of its forest management planning requirements implemented in the late 1990s. The intention of this exercise is largely to identify specific point sites that can be protected, such as historic portages and campsites, ceremonial sites, important plant harvesting areas,

known nesting sites and known mineral licks. Participating Indigenous communities may choose to keep some of this information confidential.

While Manitoba Hydro has made noticeable progress toward broad and meaningful engagement, the corporation needs to continue to build credibility and trust. To support this effort, the corporation should continue its programs to hire and promote indigenous employees in all areas of corporate activity, including those matters that affect environmental impact assessment and stewardship.

The PEP appears also to have been comprehensive and well planned and to have included mechanisms to allow for engagement input to influence planning and assessment of the project. However, here too, concern was raised by one participant group that the involvement of landowners should have occurred earlier in the process. It was argued that the absence of landowner representatives at the initial factors-and-weightings workshop led to reduced emphasis on proximity to homes and buildings. On a few specific questions related to engagement – such as the use of out-of-date maps and photos – Manitoba Hydro appears to have responded when provided with correct information. Given the rapid growth in some portions of the Route Planning Area, it is to be expected that some aspects of maps and aerial photos would quickly go out of date. As for the video depicting the transmission line, it is understandable that a video meant to be a general visualization of a 213-kilometre transmission line would lack detail. It might be helpful, however, to make clear when it is presented that it is not meant to be representative of all details.

Regarding Manitoba Hydro's draft communications plan for the project, the corporation should build on this to create

a final communication plan, providing detail both on how it will communicate and what specific issues it will communicate (such as blasting, slash burning, vegetation management and monitoring). This final communication plan should be provided to Manitoba Sustainable Development for approval, with the understanding that it may require changes as circumstances change.

In summary, Manitoba Hydro has made noticeable progress in engaging the public and Indigenous communities with interests in the land and water potentially affected by its projects. The quality of engagement efforts has been improved by building not only on the corporation's own institutional experience but by its participation in national and international organizations dedicated to public consultation. Manitoba Hydro has room for improvement in securing earlier engagement of affected groups and building trust in the transparency of their process. Early disclosure of communications and engagement activity should help in these areas.

Licensing Recommendation

The commission recommends that:

- 6.1 Manitoba Hydro complete a communication plan for the MMTP and submit it to Manitoba Sustainable Development, describing how it will communicate information about project activities, such as commencement and completion of construction, clearing, blasting and vegetation management, to individuals and communities with an interest in the project.

Non-Licensing Recommendations

The commission recommends that:

- 6.2 Manitoba Hydro take steps, in future projects, to facilitate Aboriginal traditional knowledge and land and resource use studies being completed in time to be incorporated into the environmental impact statement.
- 6.3 Manitoba Hydro, for future projects, provide a communication plan describing how it will communicate project activities, such as commencement and completion of construction, clearing, blasting, and vegetation management, to communities and individuals with an interest in the project area. This plan should be submitted as part of the EIS.
- 6.4 The Manitoba government explore with First Nations and the Manitoba Metis Federation the development of a database that could provide the government and potential developers early advice and guidance regarding ATK and traditional land uses in a project area.

Chapter Seven

Route Selection

7.1 Overview

Route selection is considered to be a key method of mitigating or reducing impacts caused by a transmission line, as it allows the greatest potential impacts to be avoided. In selecting a route for the Manitoba-Minnesota Transmission Project, Manitoba Hydro employed a methodology developed by the Electric Power Research Institute-Georgia Transmission Corporation (EPRI-GTC) that allows for numerical comparisons of all possible routes based on weighted criteria. Manitoba Hydro chose this approach because it offered a structured way of incorporating a large number of sometimes competing perspectives. The approach was designed to employ a wide range of information in the attempt to determine a preferred route that avoids or reduces impacts on the natural and built environment to the greatest extent possible, while also being suitable from an engineering and reliability perspective. The EPRI-GTC methodology is intended to be objective, quantitative, balanced and transparent and allow for various kinds of feedback to be incorporated into decision making at a relatively early point. Manitoba Hydro had employed the EPRI-GTC methodology on its St. Vital to Letellier Transmission Project, for which construction is scheduled to begin in 2018. The methodology has been applied by other utilities on more than 200 other linear projects across North America.

The EPRI-GTC methodology used for the Manitoba-Minnesota Transmission Project involved three main steps: defining the Route-Planning Area, including determining potential border crossing locations; creating alternative corridors to define suitable areas for routing the transmission line; and evaluating alternative routes generally within these corridors, leading to the preferred route. Three perspectives were used to evaluate the areas and develop routes: built environment, which considers residential development, agriculture, land and resource use, heritage and socio-economic factors; natural environment, which considers wildlife, aquatics (fish and fish habitat), vegetation and other biophysical factors; and engineering, which considers financial cost, reliability and other technical constraints.

Manitoba Hydro set forth seven broad principles to guide the development of the transmission line route:

- avoid or limit effects on residences;
- avoid or limit environmental effects;
- use existing transmission facilities;
- parallel or follow existing linear developments;
- avoid or limit effects on recreational areas;
- avoid or limit effects on agricultural operations; and

- consider length and cost of proposed facilities.

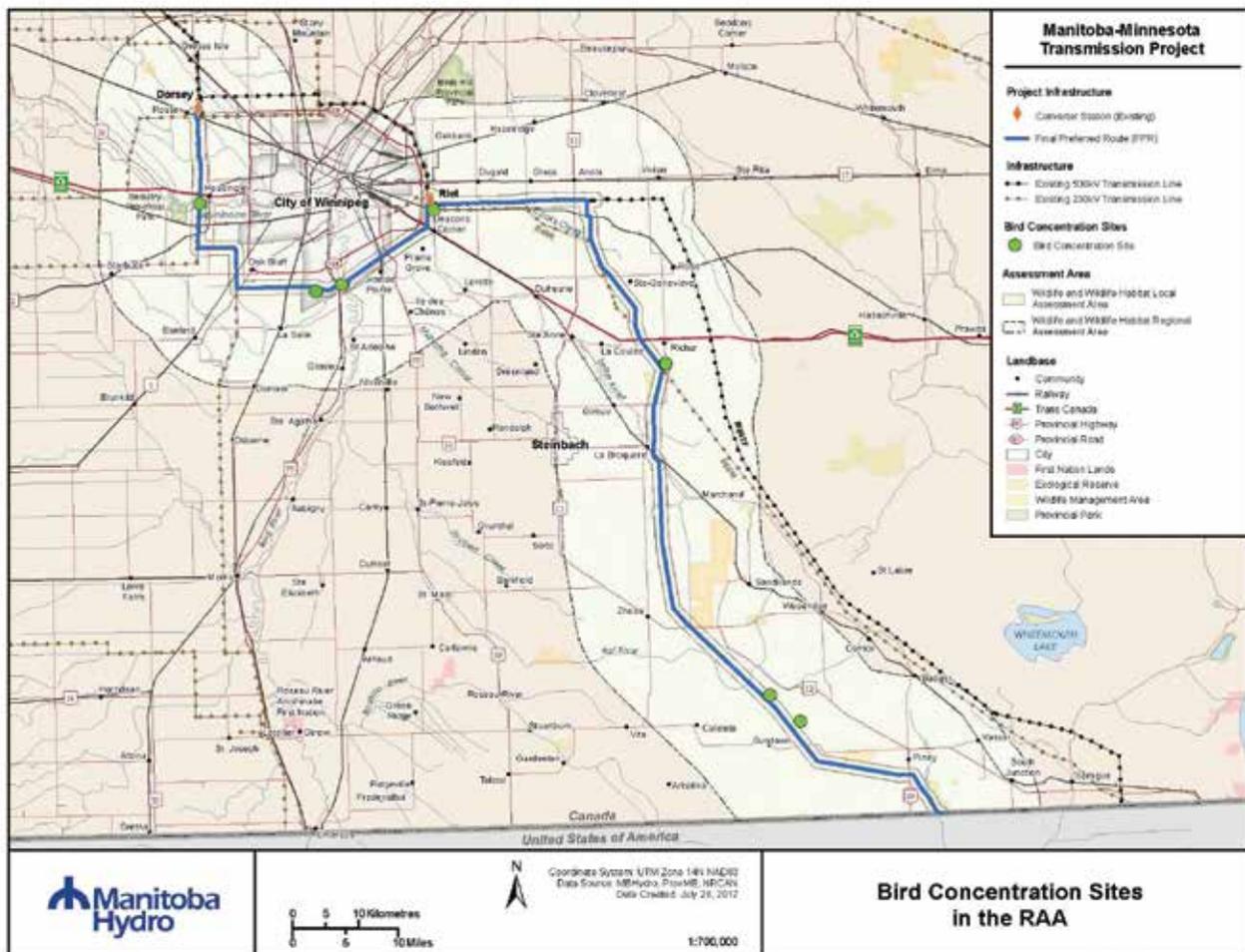
Manitoba Hydro's approach to potential effects resulting from the project is first to avoid effects where possible, to mitigate or limit the degree of the potential impact when it cannot be avoided and to compensate for effects or losses caused by the project.

The route-selection process for the MMTP used three different models for assessing the suitability of potential routes. The models, and the steps in the process in which they were used, worked to narrow down the area under consideration, from a large region of southeastern Manitoba to a specific 80- or

100-metre wide right-of-way (ROW). The models were:

- the Alternative Corridor Evaluation Model, which was used to narrow the focus to four irregularly shaped paths 10 to 20 kilometres wide, in which routes could be developed;
- the Alternative Route Evaluation Model, which was used to evaluate routes within those corridors in order to choose the best four or five in each; and
- the Preference Determination Model, which was used to evaluate the top-scoring routes within the selected corridor to lead to selection of a Final Preferred Route.

Fig. 7.1: Map of bird concentration sites, an illustration of spatial boundaries in the EIS. Dark blue line is the Project Development Area. Thin shaded area in centre is the Local Assessment Area. Wider shaded area is the Regional Assessment Area. (Courtesy of Manitoba Hydro.)



Spatial Boundaries

This report uses several terms to refer to the areas studied in the environmental impact statement (EIS). From largest to smallest, they are the Route Planning Area (RPA), the Regional Assessment Area (RAA), the Local Assessment Area (LAA) and the Project Development Area (PDA).

The RPA is the area in which alternative routes were developed during the route-selection phase of the project. Although it started off larger, the RPA took its final shape after the Gardenton West border crossing site was eliminated from consideration. It consists of an area bounded on the north by PTH 15 and on the south by the Minnesota border. At its northern end, the RPA extends almost to Grande Pointe and Ile des Chenes; the central and southern portions of the RPA have a western boundary that runs in a straight line just east of Steinbach. The eastern boundary of the RPA runs straight south from a point about halfway between Ste. Rita and Elma on PTH 15, then runs diagonally southeast to Whitemouth Lake and beyond to the Minnesota border.

The next two terms vary in size depending on the valued component (VC) under examination.

The Regional Assessment Area is an area of land that establishes the context and significance of any effects felt within the area close to the project. It is also the area in which any cumulative effects from other projects are assessed. For VCs such as wildlife and wildlife habitat and vegetation and wetlands, the RAA is an area of land extending 15 kilometres on each side of the centreline of the ROW. For some VCs, such as traditional land and resource use, the RAA takes in the boundaries of all the rural municipalities in which the project will be built. Fig. 7.1 provides an example of the boundary of the RAA, with the Local Assessment Area at its centre. The LAA consists of the physical footprint of the project, plus a smaller amount of land surrounding it. The LAA is the area in which effects of the project may be felt. For many VCs, but not all, the LAA extends one kilometre on each side of the centre line of the ROW, so that it is a two kilometre wide strip of land running from Dorsey to the Minnesota border at Piney West.

The Project Development Area is the immediate footprint of the project, consisting of the 100- or 80-metre ROW for the transmission line, any land needed for access routes to reach the ROW and the land to be occupied by the expansions at the Glenboro South Station and Dorsey Converter Station. For all of the VCs examined in the EIS, the PDA is the same size. It is based on the route selected by Manitoba Hydro as its Final Preferred Route.

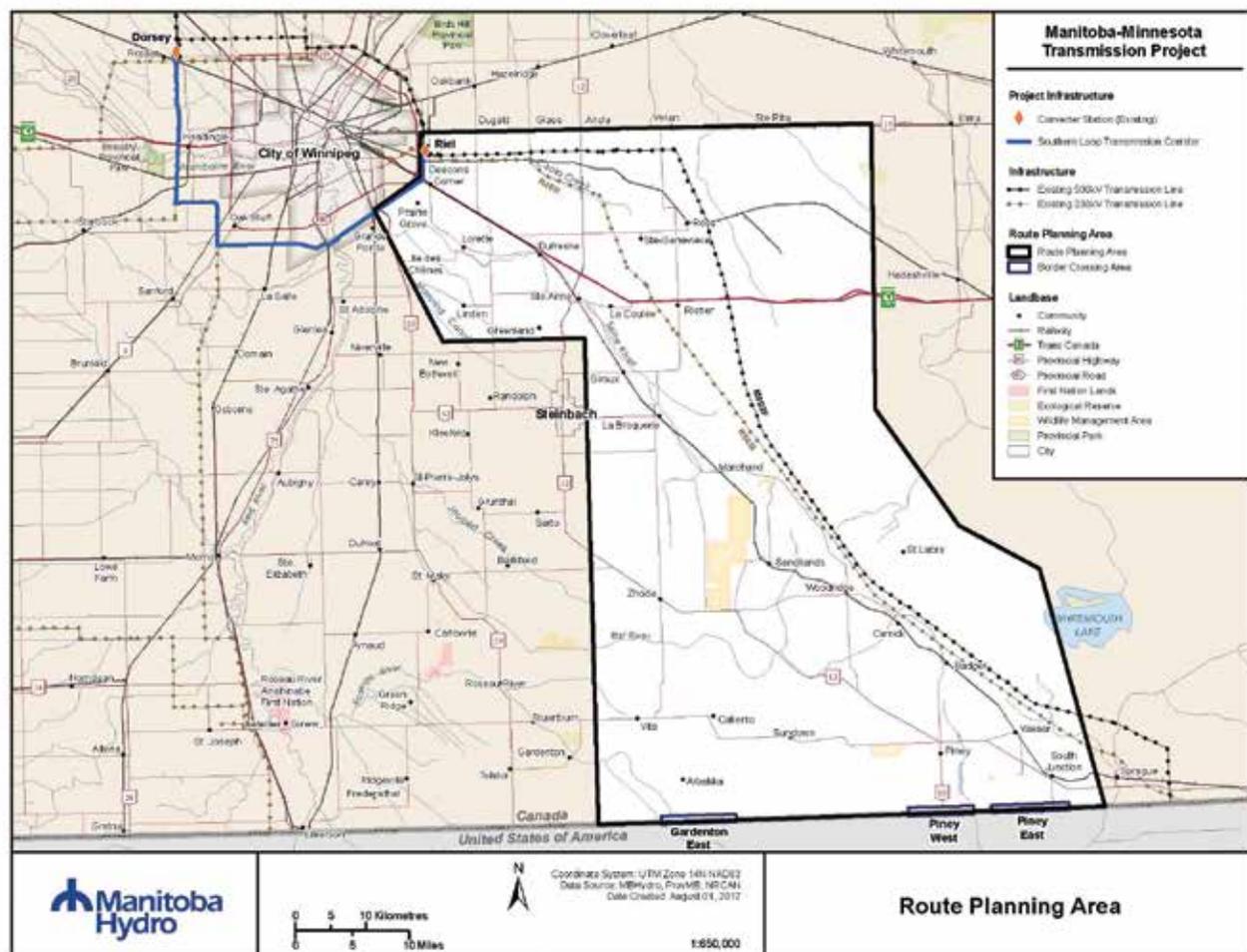
7.2 Defining the Route-Planning Area

Preliminary planning for the MMTP began in 2012 with consideration of the preliminary design of the line itself, gathering of initial data on the area, identification of stakeholders, contact with First Nations, First Nations organizations and the Manitoba Metis Federation (MMF) and determination of existing transmission lines and the ownership status of land in the area. At this stage, several system-planning concepts were examined, including whether Manitoba Hydro's needs could be met with a 230 kV line instead of a 500 kV line. The 230 kV option was eliminated, however, because it would not have sufficient capacity. As well, the origin

point for the line was selected to be the Dorsey Converter Station. This decision was reached because the other 500 kV AC line in the area (known as M602F or Riel-Forbes) now originates at the Riel Converter Station. Selecting Dorsey as the origin point for the MMTP improves system reliability by keeping the two major import-export lines separate. Also in this early stage, Manitoba Hydro began to determine potential border-crossing areas. Approximately 30 criteria were developed to help identify potential border-crossing areas.

This preliminary process included analysis of data on land use and land cover in the project area. A project team of Manitoba Hydro's staff and consultants conducted a study of the constraints and opportunities for

Fig. 7.2: Route Planning Area. (Courtesy of Manitoba Hydro.)



routing a line from Dorsey to four potential border-crossing areas, determined to be southeast and southwest of Gardenton and immediately south and southeast of Piney. These four border-crossing areas, each about 10 km wide, came to be known as Gardenton West, Gardenton East, Piney West and Piney East. Early in this process, the option of developing a route straight south of Winnipeg near Highway 75 was abandoned because of the greater concentration of residences, the flooding risk of running through the Red River flood plain and Minnesota Power not wishing to connect through North Dakota. This preliminary phase of route planning led to creation of a Route Planning Area bounded on the north by the Riel-Vivian Transmission Corridor (RVTC) and on the south by the Manitoba-Minnesota border, on the west by a line just to the west of Highway 59 and extending to the east almost to Whitemouth Lake (running approximately 20 km east of the existing Riel-Forbes M602F transmission line). (See Fig. 7.2.) Encompassing 7,245 square kilometres, the Route Planning Area includes many types of agricultural land (the most common land cover type) as well as native grasslands, shrubland, deciduous forest, mixed forest, coniferous forest and many types of wetlands. Generally, the western portion of the area is dominated by privately owned land used for agriculture, with the amount of Crown land increasing to the east, where non-agricultural land cover types dominate.

During this process, Manitoba Hydro developed four “macro corridors” – large and irregularly shaped areas through which alternative routes could later be planned. Within each macro corridor were certain areas indicated as constraints. Areas of constraint were those through which a line would not be able to run, for a variety of reasons. These areas to be avoided included lands protected as federal or provincial parks or as the protected portions of wildlife management areas, Indian reserve and treaty land entitlement

areas, known archaeological or historic sites, recreation sites, active quarries and many other kinds of developments. The macro-corridor process also identified opportunities to run the new line in parallel with existing transmission lines or roads. Running in parallel with an existing linear feature generally lessens the additional disturbance to both the built and natural environment.

Once the macro corridors were developed, Manitoba Hydro made use of what it called its Alternative Corridor Evaluation Model in order to apply three different perspectives to evaluate the potential impact of a transmission line in the various parts of the planning area. In a planning workshop held in May 2013, Manitoba Hydro invited organizations with access to data relevant to the Route Planning Area to indicate preferences for routing the transmission line through the various corridors. Three one-day workshops examined the area from engineering, natural and built-environment perspectives, with representatives from various levels of government and non-governmental organizations joining with Manitoba Hydro staff. In the engineering workshop, Manitoba Infrastructure and Transportation took part along with Manitoba Hydro. Organizations that provided input in the natural-environment workshop were Fisheries and Oceans Canada, Ducks Unlimited, the Nature Conservancy of Canada, the Manitoba Woodlot Association, the Bird Atlas of Manitoba, the Manitoba Lodge and Outfitters Association, the Manitoba Trappers’ Association, Seine-Rat River Conservation District and three program areas representing Manitoba Sustainable Development (Parks and Protected Areas, Wildlife and Fisheries, and Forestry and Peatlands). Providing information in the built-environment workshop were the Keystone Agricultural Producers, Manitoba Aboriginal and Northern Affairs, Manitoba Agriculture and Rural Initiatives, Manitoba Culture, Heritage and Tourism, local government planners, the

Manitoba Aerial Applicators' Association, Ruth Marr Consulting, the Manitoba Trappers' Association and the City of Winnipeg Planning Department.

These groups developed lists of “areas of least preference” – features in the planning area to be avoided in routing the line. They also provided input that led to the development of a system of numerical weightings of suitability for routing based on 132 features in the Alternative Corridor Evaluation Model. Features included proximity to buildings and infrastructure; water bodies and wetlands; geotechnical considerations; soil capability; and various types of land use, land cover and habitat. In this weighting system, a feature that made an area highly suited to accommodating the line would be assigned a number from one to three, a moderately suitable feature would be assigned a number from four to six and a feature with low suitability would be assigned a number from seven to nine. In addition, the workshop process also grouped the features into categories (called factors), which were weighted to yield composite scores for all of the potential routes to be developed.

With this system of weightings in place, geographic information was gathered and mapped for every part of the planning area. The Route Planning Area was broken up into hundreds of thousands of five-metre by five-metre cells. Each cell was assigned its numerical score for the various features within it. In addition to the scoring system, the process also identified 30 “areas of least preference” which were to be avoided. These included buildings, various kinds of protected areas, cemeteries, known archaeological sites, and airports and aircraft landing areas. Through this stage of the process, Manitoba Hydro created a series of maps depicting “suitability surfaces” – colour-coded maps showing the suitability of various parts of the Route Planning Area for construction of the

project, from engineering, built-environment and natural-environment perspectives. Viewing the environment from the three perspectives allowed essentially the same features to receive different suitability scores. For example, when viewed from a built-environment perspective, forest land was the most suitable for locating the transmission line, with an assigned score of 1.0. Various kinds of agricultural uses were ranked as less suitable for a transmission line, with forage land scoring 4.9, crop land scoring 6.6, aerial application agricultural land scoring 8.9 and irrigated agricultural land scoring 9.0 (the higher the score, the less suitable). However, viewed from a natural-environment perspective, various kinds of forest scored 5.5 to 6.0 and agricultural forage and crop land scored 2.5 and 2.8, respectively. Other features also had scores that varied from one perspective to another. From a built-environment perspective, organic soils and peat bogs scored 3.9 (moderately suitable), whereas from a natural-environment perspective, bogs, fens and marshes scored 7.7, 8.2 and 8.3 (highly unsuitable).

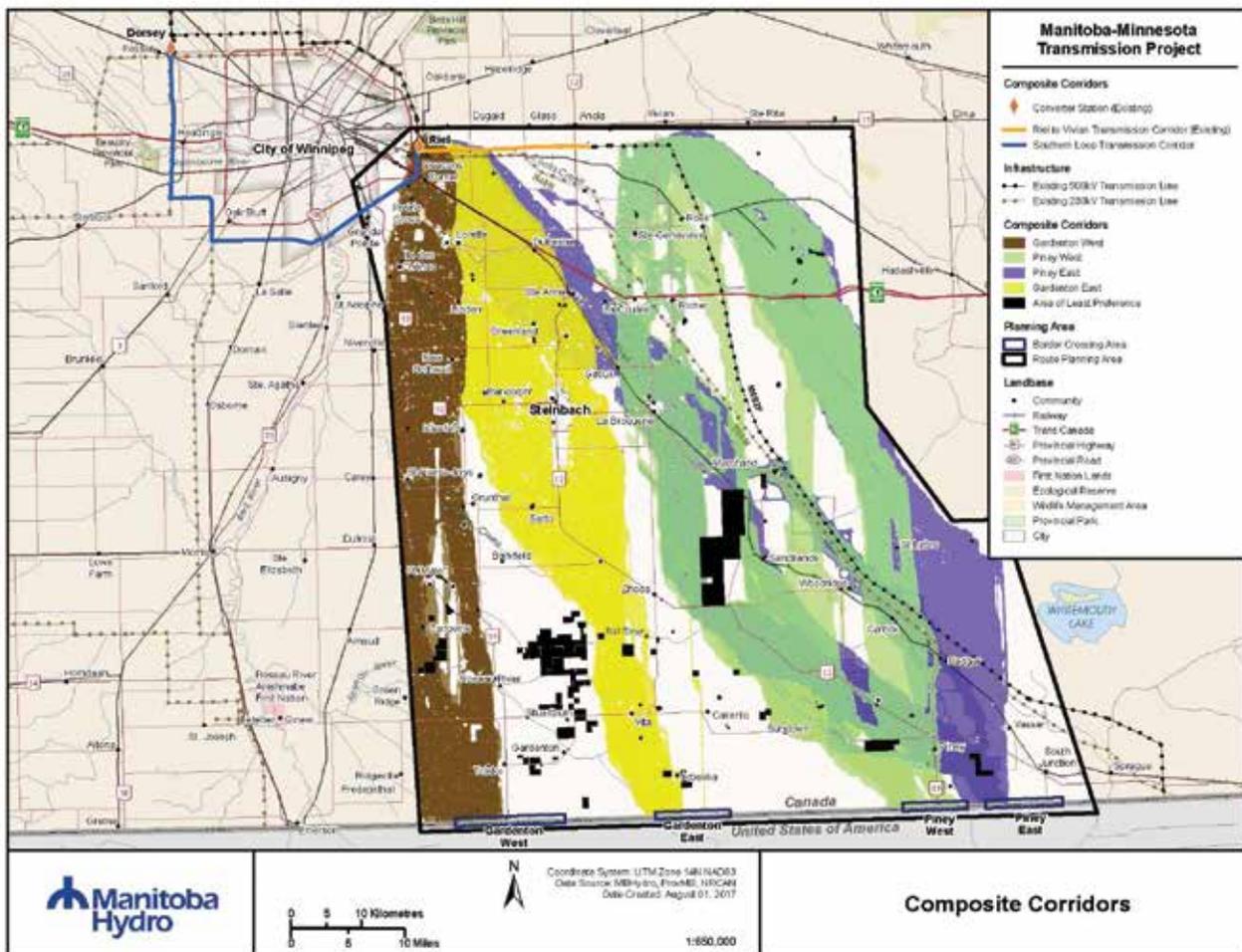
Combining all of the geographic data for the Route Planning Area, broken down to the level of five-metre-by-five-metre cells, allowed for hundreds of thousands of potential routes to be automatically generated and scored. The computerized process, therefore, made it possible to link the best-scoring areas from the start point to the U.S. border crossings. Using what was termed “least-cost path analysis” the best scoring three per cent of these routes could be selected and used to indicate the locations of the alternative corridors. It should be noted that the phrase “least-cost path” actually means “best-scoring path” – because it combines the scores for natural environment, built environment and engineering. All of this data gathering, analysis and weighting led to the development of alternative corridors of irregular width, running from the eastern end of the Southern Loop Transmission Corridor

(SLTC) or the eastern end of the Riel-Vivian Transmission Corridor (RVTC) to each of the four potential border crossings. (See Fig. 7.3)

While this process was occurring, Manitoba Hydro and Minnesota Power reached the decision to eliminate the Gardenton West border crossing from consideration. In Manitoba Hydro's assessment, the Gardenton West crossing was unsuitable because using it would require the transmission line to traverse more high-density development and specialized agricultural land as well as crossing over the St. Vital-Letellier Transmission Project and the Bipole III Transmission Line. From Minnesota

Power's point of view, the Gardenton West crossing would cause more conflicts with agriculture and would be farther from the eventual destination in the Iron Range area. With the elimination of the Gardenton West border crossing, the western boundary of the Route Planning Area was then adjusted to just east of Steinbach.

Fig. 7.3: Route Planning Area, Alternate Corridors (in colour) and Potential Border Crossings. (Courtesy of Manitoba Hydro.)



Types of Designated or Protected Land

During the route-selection process, various kinds of designations of Crown land were discussed. On some occasions, the term “protected area” was used in this process. Within Manitoba, “protected area” refers to areas where, at a minimum, logging, mining (including aggregate extraction), oil, petroleum, natural gas and hydro-electric development are legally prohibited. Some protected areas remain open for hunting, trapping and fishing. Others, which contain rare or sensitive habitats, have greater restrictions on uses and activities. Manitoba’s network of protected areas includes ecological reserves, national parks, traditional use planning areas, the protected portions of provincial parks and park reserves, protected portions of wildlife management areas and provincial forests, plus private lands that have conservation agreements. Under *The Crown Lands Act*, the Lieutenant Governor in Council is empowered to set aside Crown lands for provincial parks, provincial forests, wildlife management areas, game reserves, bird sanctuaries and other purposes. *The Crown Lands Act* also empowers the Lieutenant Governor in Council to set aside Crown lands to be used to enable Canada to fulfill treaty obligations. These lands are referred to as treaty land entitlement (TLE) lands.

7.3 Developing Alternative Routes

With three potential border crossings and a model in place for evaluating suitability for transmission line routing, Manitoba Hydro moved on to Round One of its transmission line routing exercise. The objective of Round One was to determine the preferred border crossing for the line, out of the three remaining crossings to be considered. Selection of the preferred crossing would remove from further consideration potential routes leading to the eliminated crossings. In Round One of the route-selection process, input from the Public Engagement Process (PEP) and the First Nations and Metis Engagement Process (FNMEP) informed decision making.

Manitoba Hydro’s project team staff developed 87 alternative segments for routes that would travel through the remaining three alternative corridors. These segments were presented to participants in the two engagement programs and additional segments were developed to avoid areas of concern. Segments were combined in various configurations to create routes running from the start to end points for the MMTP.

Approximately 750,000 such potential routes were automatically created in this way, although many of these were long, meandering and impractical. All alternative routes began at the Dorsey Converter Station and first travelled through the Southern Loop Transmission Corridor (SLTC) to get around Winnipeg. Some of the routes left the SLTC just southeast of Winnipeg and continued southeast from that point, while others followed the SLTC to the Riel-Vivian Transmission Corridor (RVTC), which runs in an east-west line parallel to PTH 15, and turned south at some point along that corridor. Because a shorter line is generally preferable to a longer one – both because of the costs of labour and materials and the

greater area directly impacted by a longer line – routes more than 20 per cent longer than the shortest routes for each alternative corridor were automatically rejected. A small number of best-scoring potential routes for each corridor were presented in the Public Engagement Process and the First Nations and Metis Engagement Process to gather concerns and preferences. Key person interviews, open houses, stakeholder workshops, and other tools were used to gather input on the potential routes.

A second evaluation model, called the Alternative Route Evaluation Model, was then used to compare the potential routes against one another, again using criteria from the three perspectives of engineering, natural environment and built environment. For each of the 22 criteria in this model, the raw numbers (including acres of a particular land cover, number of residences within a certain distance and estimated cost of construction) were normalized into numbers from 0.0 to 1.0. This allowed for numerical comparison of factors otherwise measured in different terms. Within the built-environment category, the greatest weights were attached to the presence of residences within the ROW of a potential route (27.1 per cent); residences within 100 metres of a potential ROW (17.1 per cent); proposed developments within a potential ROW (15.5 per cent) and diagonal crossings of agricultural land (9.9 per cent). Within the natural environment category, the highest-weighted criteria were described as “conservation and designated lands” crossed by the ROW (33.3 per cent), intactness of the land crossed by the ROW (defined as the amount of the ROW that cuts through areas of intact natural habitat that are at least 200 hectares in size; weighted at 25.9 per cent), stream or river crossings (16.4 per cent) and wetlands crossed by the ROW (16.4 per cent). In the engineering category, the highest weightings were assigned to cost (33.3 per cent), proximity to existing 500 kV lines

(29.5 per cent), seasonal construction and maintenance restrictions (16.4 per cent) and accessibility for construction and maintenance (16.5 per cent).

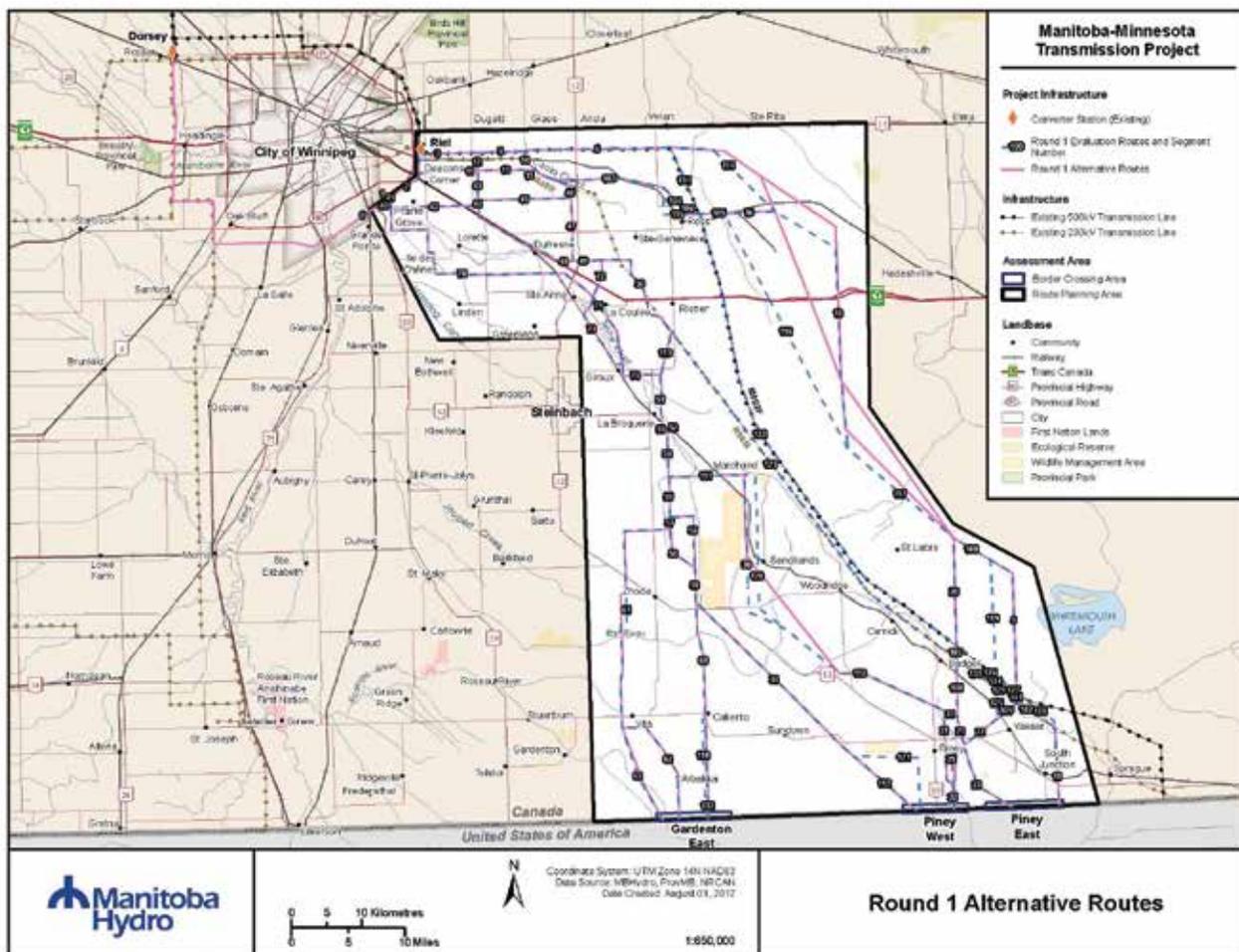
Of particular note, the criterion of “proximity to existing 500 kV lines” prefers potential routes that do not come within a 10-kilometre buffer of the existing 500 kV line, as keeping transmission lines separate reduces the risk of severe weather such as a tornado damaging both lines. Manitoba Hydro notes that following Round One of the engagement processes, the 10-kilometre buffer was relaxed because of preference from public and Indigenous participants for lines that parallel existing lines. Manitoba Hydro decided that for lines along the RVTC, proximity to an existing 500 kV line would be less of a concern, as the location close to Winnipeg would allow repair crews to reach a damaged line easily. As well, since the RVTC runs west-east and the usual path of extreme storms in southern Manitoba is also west-east, running the two 500 kV lines together along this corridor presents less risk than running them together in a north-south portion of the route. Based on historical data, Manitoba Hydro conducted a statistical exercise in which it simulated the occurrence of tornadoes that could potentially damage both the MMTP and the existing 500 kV transmission line. The study concluded that if the two lines ran together along a north-south portion of the line, the statistical probability of both being damaged in the same storm was once in 33 years. In the west-east RVTC, however, the statistical probability of such an occurrence was once in 93 years. The 10-kilometre buffer was retained in planning the portions of the line running generally north to south from the RVTC to the Minnesota border.

Input from the two engagement processes reflected the differences between the built-environment and natural-environment perspectives. Public input in agricultural

communities often favoured potential routes in the eastern portion of the Route Planning Area, which would entail the transmission line travelling largely through Crown land containing forests and wetlands. However, First Nations and Metis participants and other participants who were more focused on wildlife, native vegetation and other ecological values urged that the line be located on land that had already been modified by agriculture. A similar difference of opinions had been noted previously during the process leading to the Bipole III transmission line, and at that time the Clean Environment Commission had recommended that Manitoba Hydro not view Crown land as the default option for routing transmission lines.

The top-scoring routes for each of the border crossings – based on results from the Alternative Route Evaluation Model – were then evaluated using a third model, known as the Preference Determination Model. The criteria and weightings used in the Preference Determination Model had been developed by the management team of senior Manitoba Hydro staff earlier in the process. An initial meeting to develop this model was held in September 2013, and a second meeting was held in January 2014. The model incorporated six criteria: cost (40 per cent), community (30 per cent), system reliability (10 per cent), natural environment (7.5 per cent), built environment (7.5 per cent) and schedule risks (five per cent).

Fig. 7.4: Round One Alternative Routes. (Courtesy of Manitoba Hydro.)



The purpose of the preference determination step was to select one top route for each border crossing, and then to compare these routes with one another to determine the top route overall. In this step, the project team – including design and construction engineers, project managers, and bio-physical and socio-economic specialists – gave the routes scores of one to three (with the lower number indicating a preference within each of the criteria). This was done using input from the PEP and FNMEP processes for the community scores and with input from biophysical and socio-economic specialists for the natural environment and built environment criteria.

After evaluating the best-scoring potential routes for each of the three border crossings, Manitoba Hydro selected one leading to the Gardenton East border crossing. This route was preferred from an engineering perspective, on the basis of reliability (particularly the distance from other transmission lines) and a lack of construction constraints, and from a natural environment perspective because it would disturb the least natural habitat.

During this process, Minnesota Power indicated a preference for the Piney East border crossing, as it would lead to a shorter route for the line in Minnesota to the Iron Range, and would have fewer identified concerns. From Minnesota Power's perspective, Gardenton East was not feasible because of the higher amount of prime agricultural land and greater potential landowner conflict to the west of Red Lake, Minnesota. However, from Manitoba Hydro's point of view, Piney East would disturb the largest amount of natural environment, would be more difficult to build and maintain because of larger amounts of wetland and would therefore be the most expensive route. This then led to the decision to pursue the Piney West crossing, as it was acceptable to both Manitoba Hydro and Minnesota Power.

7.4 Selection of the Preferred Route

With Piney West now selected as the border crossing, Manitoba Hydro then began Round Two of the route-selection process by using the best-scoring route to the crossing. Several alternative segments within this route were then developed and assessed. These alternative segments were presented to participants in open houses, workshops and other meetings and feedback was gathered.

Alternative segments were proposed to move the line farther from existing homes or future developments, to avoid sensitive habitat, to take advantage of existing transmission lines, to create greater separation from the Ridgeland Cemetery, and to create a greater separation from sensitive areas such as the Watson P. Davidson Wildlife Management Area (WMA). Combining the various alternative segments led to the creation of five different alternative routes to the Piney West crossing. These were then compared to one another using the same Preference Determination Model as described previously.

This stage began with four routes that had been selected earlier as the highest scoring from the perspectives of engineering, built environment, natural environment and simple average of the three perspectives. Two of these routes (named URV and URQ) were extremely similar except for a short stretch south and west of the village of Piney. These two routes would both leave the SLTC south of Winnipeg and east of Grande Pointe and travel east southeast in steps to the R50M 230 kV transmission line, northwest of Richer. These routes would parallel this line for a short distance to the Richer South hydro station, then travel south past La Broquerie, cross to the west of the Watson P. Davidson WMA and then travel diagonally southeast to the Piney

West border crossing. These routes generally had better scores from a natural-environment perspective and generally better reliability scores resulting from distance from the M602F 500 kV transmission line.

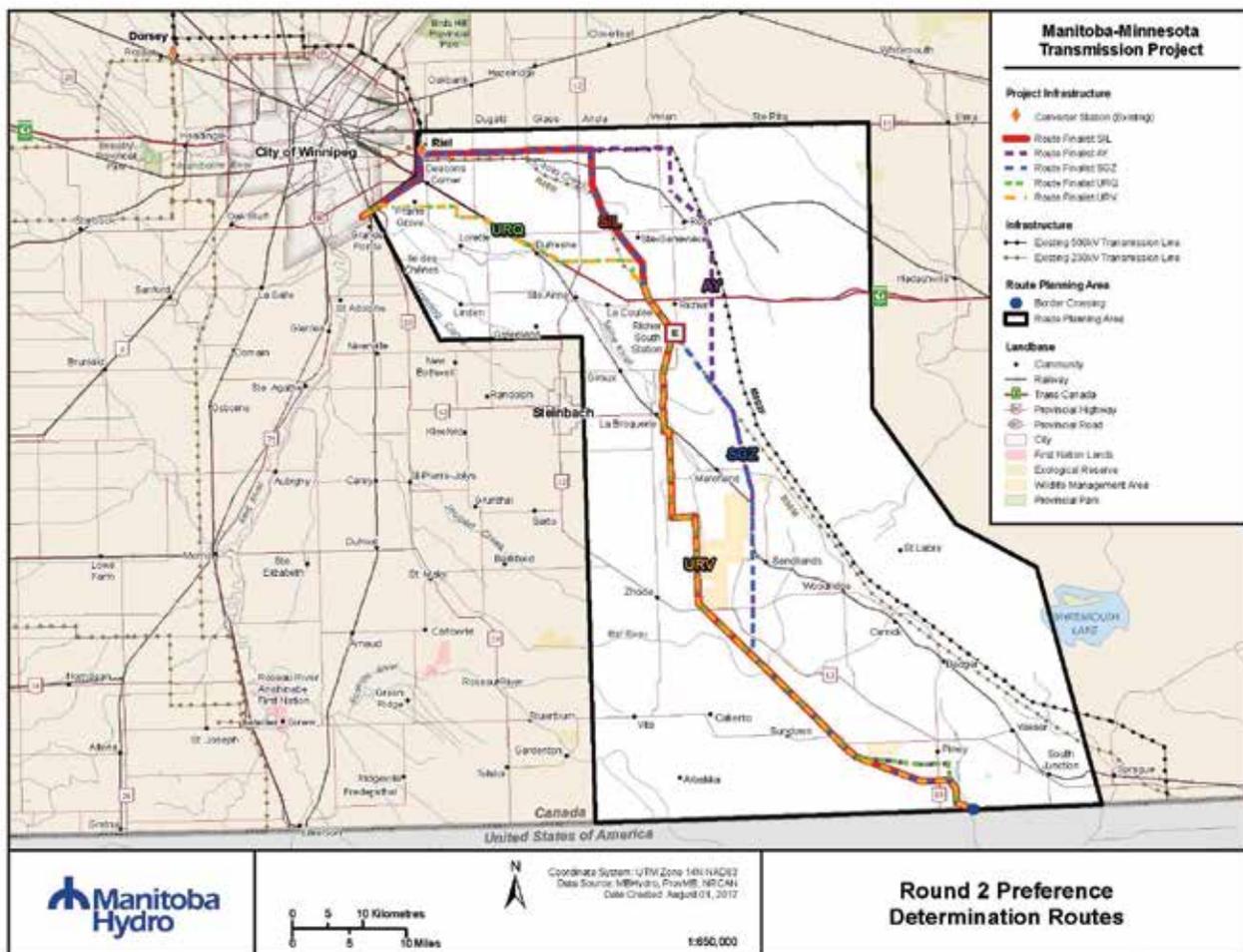
The other two routes initially chosen for this stage of evaluation travelled further east within the planning area. Route AY would follow the SLTC to the RVTC and follow the RVTC to Vivian. From there it would travel southerly, paralleling the M602F line, cross to the east of the Watson P. Davidson WMA, and join with the URV and URQ lines south of the WMA. Route SGZ would follow the SLTC to the RVTC, but would leave the RVTC south of Anola and parallel the R50M 230 kV transmission line to a

point north of Marchand. From that point, it would follow the same route as route AY. Routes AY and SGZ scored better from a built-environment perspective.

One additional route was added to this round, combining elements of the others. Route SIL would initially take the same route at SGZ – following the SLTC to the RVTC and paralleling the R50M transmission line. However, at the Richer South Station, Route SIL would continue south and follow the same route as URQ and URV, passing to the west of the Watson P. Davidson WMA.

The project team held a route selection workshop on November 17 and 18, 2014, and used the Preference Determination

Fig. 7.5: Round Two Preference Determination Routes. (Courtesy of Manitoba Hydro.)



Model, discussed previously, to select a route based on its scoring using the engineering, built-environment and natural-environment perspectives. After considering the five routes, the team selected Route SIL. Route SIL had the lowest (best) score in Manitoba Hydro's system of blending engineering, natural-environment and built-environment criteria, although public participants in the PEP preferred route AY, which avoided more residences and prime agricultural land. Participants in the FNMEP, however, stated a preference to avoid Crown lands. While SIL travels more directly south from the Richer South Station on Manitoba Hydro's existing 230 kV transmission line and passes to the west of the Watson P. Davidson WMA, AY parallels the existing 500 kV M602F transmission line and passes to the east of the Watson P. Davidson WMA through the Sandilands Provincial Forest. Route SIL was assigned the best score under the community criterion because in the conclusion of the team evaluating the routes, "it was the best compromise between the two perspectives (PEP/FNMEP)."

After this workshop, another change to the border-crossing location resulted in some additional route modifications near the southern end of the route. It became necessary to move the border crossing by approximately 6.6 kilometres in order to avoid conflict with future expansion of the Piney-Pinecreek Border Airport.

7.5 Development of the Final Preferred Route

Round Three of the route-selection process made use of meetings through the PEP and FNMEP to fine-tune the preferred route and determine the Final Preferred Route (FPR).

In this round of the process, alternatives were developed that would respond to

concerns about the effect of the line on future development in the areas of St. Genevieve and La Broquerie, possible effects on livestock operations south of La Broquerie, effects on a parcel of land, near Sundown, recognized as having specific cultural importance to First Nations and various local landowner concerns.

7.5.1 Mitigative Segments

After selection of the Final Preferred Route, Manitoba Hydro received feedback expressing concerns about a variety of specific potential impacts in locations along the line. Some resulted in relatively minor changes to move the line farther from residences or sensitive sites. Another route selection workshop was held with Manitoba Hydro staff and discipline specialists, during which mitigative segments were compared directly with one another in terms of their potential effects on the natural and built environment and their engineering suitability. Manitoba Hydro then developed five different versions of the FPR making use of various combinations of these mitigative segments and again used the Preference Determination Model to evaluate them. The chosen version of the FPR, named route BMV, was the top ranked of the five in engineering and natural-environment terms. Two routes, BWZ and BXP, were the top-ranked routes from a built-environment perspective because they were farther from the town of La Broquerie and avoided more privately held agricultural land. A series of aerial photos, on which both the FPR and the mitigative segments were drawn, illustrated this process of fine-tuning. In one example, a portion of the FPR east of La Broquerie was modified in order to place the line farther from a small subdivision along Quintro Road.

Fig. 7.6: Quintro Road route modification. Light blue line is a mitigative segment to move the route farther from houses. (Courtesy of Manitoba Hydro.)



7.6 Final Preferred Route Statistics

Manitoba Hydro presented a table of figures to characterize the Final Preferred Route that indicated the balance of built-environment, natural-environment and engineering perspectives used in this process. The characteristics of the selected route were reflected in the assessment of natural and socio-economic effects, which will be discussed in Chapter Eight and Nine. (Note: the EIS uses both metric and Imperial measurements in places, largely because acres are still the most frequently used measurement of area in agricultural regions. One hectare is slightly less than 2.5 acres.)

Built Environment

Residences within ROW	1
Residences within 100 metres of ROW	23
Residences 100-400 metres of ROW	198
Proposed residential developments within ROW	23
Acres of annual crop	747
Acres of hayland	1,212
Acres of Class 1-3 soil	2,345
Acres of Class 4-5 soil	965
Acres of prime agricultural land crossed diagonally	53
Buildings/structures within 100 metres of ROW	53
Public-use areas within 250 metres of ROW	18

Historic resources within 250 metres of ROW	9
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Acres of potential commercial forest	433
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Natural Environment¹

Crown land traversed by the FPR (kilometres)	36
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Acres of forest in ROW	1,717
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Intactness (acres of ROW crossing areas of intact natural habitat at least 200 hectares in size)	2,021
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Stream/river crossings	49
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Acres of wetland	415
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Acres of conservation and designated lands	254
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Engineering Perspective

Length in kilometres	213
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Existing transmission line crossings	17
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Project costs (Including station upgrades)	\$350 million ²
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¹Some natural-environment numbers used in this table differ from those used by the subject specialists who conducted the assessments of the various VCs. Including all rivers, streams, ephemeral streams and agricultural drains, 75 watercourses are crossed by the transmission line. Using more detailed desktop mapping based on aerial imagery, the PDA includes 458 hectares (approximately 1,155 acres) of wetlands. While the ROW contains 1,717 acres of forest, it will require 550 hectares (about 1,375 acres) of forest clearing, because some of the lands classified as forest are currently cleared as a result of logging or forest fires.

²Estimate used in the EIS, increased to \$453 million according to information presented at the hearings.

What We Heard – Route Selection

Manitoba Hydro's use of the EPRI-GTC route-selection approach was criticized during the hearings by some participants who questioned the value of the method and how it was adapted for use in the MMTP.

Several participants raised questions about the workshops held May 6-8, 2013, to determine the features, values and weightings used in the Alternative Corridor Evaluation Model. Manitoba Hydro's decision to invite only "technical knowledge holders" it believed had access to or perspectives on geographic data for the Route Planning Area came under criticism. Indigenous people, it was observed, are knowledge holders for the area, given their long history of use of and travel through southeastern Manitoba. Traditional travel routes passing through the region to the Red Lake region of Minnesota have been used by the Anishinaabe and the Dakota people for hundreds or thousands of years. More recently, Indigenous people living in or near Winnipeg have made extensive use of Crown land in southeastern Manitoba for harvesting and cultural activities, as it represents one of the closest areas with land available for these practices.

Several participants observed that maps prepared by Peguis First Nation and the Aboriginal Traditional Knowledge Study Management Team (representing Swan Lake, Long Plain and Black River First Nations, and referred to as ATKS) provided information on Indigenous use of the study area that would have informed the route planning process had they been available for review earlier.

Other participants noted that neither landowners nor groups representing consumers had representation at the early workshops that established criteria and weightings for the Alternative Corridor Evaluation Model.

It was noted that the models used in route selection lacked criteria that represented effects on the specific interests of First Nations or Metis. The Alternative Corridor Evaluation Model, used at an early stage in the process, had no input specifically identifying Indigenous interests, other than identifying Indian reserves and TLE selections as "areas of least preference." The Alternative Route Evaluation Model, used later in the process, had no criteria for Indigenous harvesting areas or areas of Indigenous cultural or historic use.

Lack of diversity in viewpoints was raised as an issue by participants who noted that the criteria used to evaluate routes were weighted initially by a group of four Manitoba Hydro managers, all of whom were engineers who spent their entire careers at Manitoba Hydro. It was suggested that this resulted in a built-in bias toward engineering criteria in the Preference Determination Model, which was used to select the Final Preferred Route. With cost weighted at 40 per cent, system reliability at 10 per cent and schedule risks at five per cent, it was argued that this model made engineering factors worth more than natural environment and built environment factors combined. It was noted that the Final Preferred Route largely fits within the corridor identified early in the route planning process as the best from an engineering perspective.

A related concern focused on decisions made in adapting the EPRI-GTC model to the MMTP after its earlier use by Manitoba Hydro for the St. Vital-Letellier transmission line. In adapting the models that had been used on the St. Vital-Letellier project, Manitoba Hydro lowered the weighting for several criteria related to proximity to residences and other buildings. A participant also expressed concern about the use of "schedule risk" as a criterion. Workshop notes from the Manitoba Hydro routing workshops indicated that Manitoba Hydro staff considered the potential for delays in the Section 35 Crown

consultation process (the process by which governments in Canada must consult with Indigenous groups regarding potential impacts on treaty and Aboriginal rights) to be a risk to the construction schedule affecting routes crossing more Crown land. Routes that cross more private land were assigned a lower risk to schedule. The participant argued that this indicated that Manitoba Hydro has assumed it would be easier to expropriate private property, as property owners would be denied the right to fight the expropriation in court.

The large number of variables used in the early part of the routing process, particularly the 19 weighted factors further broken down into 132 features used in the Alternative Corridor Evaluation Model, was raised as a concern by one participant group. It was argued that the large number of features allowed for the importance of any individual feature to be diluted. In this group's view, the factor that is typically viewed as most important in routing of transmission lines, proximity to residences (buildings in this case), was reduced in importance by the large number of other factors and features. At the Alternative Corridor Evaluation stage and later in the process, the large number of factors – weighted to the nearest one tenth of one per cent of the total score – created a problem of “false precision.”

Another critique of the methodology focused on the way criteria were weighted in the final step, use of the Preference Determination Model. In this step, routes were given scores of one, two or three (with one being preferred) in each of the criteria. It was argued that this approach magnified small differences. There could, for example, be a very slight difference between two routes in a specific criterion, but assigning one route a score of one and the other a score of two would make it appear that the better-ranked route was twice as suitable in that criterion.

The change made to the Piney West border crossing – in which the crossing location was shifted approximately 6.6 kilometres to the east in order to avoid impacting expansion plans of the Piney-Pinecreek Airport – was the source of another critique of the EPRI-GTC methodology. Using the methodology, routes leading to border crossings that were eliminated were themselves eliminated from further consideration. One participant argued that this fact meant that potentially viable routes were removed prematurely from future consideration. The participant argued that the eastward relocation of the border crossing meant that at least one route leading to Piney East was now worthy of re-consideration as a viable route.

The EPRI-GTC methodology, rather than being objective and scientific, allowed Manitoba Hydro to influence the results of the routing process to ensure that the company's preferred route was the one selected, it was argued. As evidence of bias, one participant argued that the route that was selected, Route SIL, was not one of the highest rated routes prior to the route selection workshop and had been added back into consideration by Manitoba Hydro staff.

The Final Preferred Route was of particular concern in the area around La Broquerie and in the R.M of Taché. The commission heard 10 presentations from residents of these areas during hearings held in the community and also read written submissions from residents. A common theme of many of these presentations concerned the weighting of impacts on residential or agricultural uses of land, compared to impacts on the natural environment. Most of these presenters recommended that the FPR be moved to the east of the planning area to travel through Crown land on routes that scored better from a built-environment perspective.

Commission Comment – Route Selection

In its report on Manitoba Hydro's application for an *Environment Act* licence to build and operate the Bipole III transmission line, the Clean Environment Commission called on Manitoba Hydro to develop a more transparent, objective routing system. Based on the information presented in the EIS and in the subsequent information requests and the hearings, it appears that Manitoba Hydro has made significant strides to reach that objective.

The panel notes that Manitoba Hydro's decision to employ the EPRI-GTC methodology was made in part because "the tools used in the methodology provide a structured and transparent way to represent the trade-offs between competing stakeholder interests and land uses." Manitoba Hydro also states that the EPRI-GTC methodology allowed stakeholder input to assist in development of criteria. The panel recognizes that high weightings for areas such as wetlands, natural forests and critical habitat may have indirectly accounted for preferences that were later identified by First Nations and Metis participants in the FNMEP. However, at the early stages of the route-selection process, in which models were adapted for use and geographic data were used to determine alternative corridors, Indigenous input and interests appear to have been absent. Involvement of Indigenous representatives at the initial workshop in May 2013 would have broadened the knowledge base for the creation of alternative corridors and assisted with the goal of using a more transparent process.

Incorporating Indigenous interests into the key principles used in transmission line routing would help to ensure that these views are represented throughout the process. In the seven principles employed in route determination, as described by Manitoba Hydro during the hearings, several principles

were structured along the lines of "avoid or limit effects on" the natural environment, residences or agricultural operations. The addition of a principle to "avoid or limit effects on" sites in which there is Indigenous interest would have brought Indigenous interests and knowledge into the route-selection process at an earlier point. To Manitoba Hydro's credit, the process in its entirety did give weight to avoiding and limiting effects on sites and areas where there was a clear Indigenous interest. In practice, it appears as though there was such a principle being observed. It would seem logical to make this officially part of the planning process.

A similar presence for Indigenous interests would have enhanced other aspects of the route-selection process. The lengthy list of features in the Project Study Area developed in the Alternative Corridor Evaluation Model would have been enhanced if features such as "important Indigenous harvesting sites" or "Indigenous cultural and heritage sites" had been included earlier in the process. For example, a large number of specific features of the natural environment related to vegetation cover and wildlife habitat are included in the model, but none of them refers specifically to plant harvesting or important hunting areas for Indigenous people. The model also contains, as a feature of the built environment, references to national, provincial, and municipal historic sites and the heritage sites, but no reference to Indigenous cultural or heritage sites.

Another of the major criticisms concerned the weighting attached to the Preference Determination Model, the model that was used in the step in which the Final Preferred Route was chosen. The weightings of the criteria in this model were such that engineering and cost constituted 55 per cent of the final score. This left community (30 per cent), natural environment (7.5 per cent) and built environment (7.5 per cent) at a

total of 45 per cent of the final score. In other jurisdictions, it was argued, engineering, natural environment and built environment were treated equally, with each weighted at one third of the final score.

In this case, however, it is difficult to see how a one-third/one-third/one-third weighting model would have led to a substantially different result. In the case of the MMTP, engineering and natural environment criteria lined up in such a way that routes or route segments that were favoured from an engineering perspective were also likely to be favoured from a natural environment perspective and, as it turns out, from an Indigenous perspective. Routes in the eastern portion of the MMTP planning area scored low in the engineering perspective for several reasons: they travelled more closely to the north-south portion of the existing M602F 500 kV transmission line (thus creating reliability risks), they would involve more expensive construction in wetland areas, they would involve more costly construction of access routes, and their more remote location would make servicing the line more difficult. Some of the same factors that make the eastern area less suitable from an engineering-and-cost perspective also make it less suitable from natural-environment and Indigenous perspectives. Construction in wetland areas is not only more expensive, but more disruptive to the environment. Similarly, besides being more costly, creation of new access routes for construction results in more clearing of forest and more fragmentation of intact habitat. The relative remoteness that would make an eastern line more expensive to maintain is also a factor that makes the eastern area more valuable for wildlife habitat and for Indigenous resource harvesting. Therefore, even if the weightings of engineering, natural environment and built environment had been more equal, the evaluation likely still would have led to a route travelling to the west of the Watson P. Davidson WMA and avoiding the Sandilands Provincial Forest.

Although in this case, the relatively low weighting for natural environment factors in the Preference Determination Model did not result in a route that would be more harmful to the environment, in the future Manitoba Hydro should make sure that such under-weighting is not repeated. It does not seem appropriate in this age of environmental awareness for the natural environment to count only for 7.5 per cent of the score in the most important evaluation model used in development of a major project like the MMTP.

Just as there were no Indigenous representatives at the 2013 workshop that determined the weightings used in the Alternative Corridor Evaluation Model, neither were there any landowner representatives. Landowners too hold knowledge and perspectives about the land not necessarily available in data sets. One participant noted that the engineering perspective corridor developed at this stage in the process anticipated the eventual Final Preferred Route. Later in the process, during the preference determination stage for evaluating alternative routes, a weighting of 7.5 per cent was assigned to the built environment. This too seems low when compared to the weights assigned to some other criteria.

It should be noted, however, that the relatively low weightings assigned to the natural environment and to the built environment criteria within the Preference Determination Model were somewhat offset by the views of the Indigenous community representatives and landowners respectively, which were considered in the “community” criteria.

Despite these concerns, it bears repeating that the EPRI-GTC methodology was transparent, open and thorough. Some of the challenges experienced by Manitoba Hydro

in this process were a direct result of the corporation's efforts to fulfill the commitment to developing a more transparent route-selection approach. The EIS for the MMTP included detailed meeting notes of the internal discussions during which the project team discussed routes and route alternatives. This made it possible for readers of the EIS to see where the project team had disagreements or where compromises were made. Frank assessments of the challenges posed by selecting the FPR or the other alternatives were included in these meeting notes. It is clear from reading the notes that no route would have been perfect and difficult decisions had to be made. This transparency appears to have provided critics of Manitoba Hydro's decision with supporting information for their arguments. Ultimately, the panel considers that such transparency is necessary to encourage greater community involvement in future routing decisions and greater trust between Manitoba Hydro and the communities it works with.

In summary, the structured decision-making embedded in the EPRI-GTC methodology represents a significant positive step compared to previous route-selection processes. It produced a clear record of the factors that led to decisions and the trade-offs and compromises made. There were several documents posted on Manitoba Hydro's public site that were used by participants as critiques of the decisions and the process itself. This may make Manitoba Hydro's work more challenging, but it is also in the broader public interest to generate vigorous debate that can raise the overall level of professionalism in making these important decisions that must, by their nature, balance conflicting perspectives. Transparency in providing the quantitative results has the added advantage of making it possible to replicate the process. If the workshops that developed models and identified routing constraints early in the process had been more inclusive – with First

Nations, Metis, landowner and consumer representation – that would have led to even greater transparency.

While there was a great deal of transparency in the EIS and its supporting documents regarding the route-selection process, one important decision received relatively little attention. The negotiations over the border-crossing location – held between Manitoba Hydro and Minnesota Power – are discussed in very minimal detail. It appears that a great deal of work went into the early stages of the process, leading Manitoba Hydro to select Gardenton East as its preferred crossing, before the border crossing negotiations with Minnesota Power were concluded. It is inevitable that in a project such as this the partners will need to negotiate a matter such as the border crossing location, but Manitobans might have been better served by more information on Minnesota Power's decision, since it appears to have taken Manitoba Hydro's original preference off the table.

The complexity of the route-selection process encouraged criticism and perhaps made it more difficult for Manitoba Hydro to explain. The large number of different models and the sometimes-cumbersome terminology (for example, "suitability surfaces," "preference determination," "least-cost path analysis") made the process difficult to understand. Regarding the suitability surfaces, this highly detailed mapping activity created maps that depicted the suitability of areas within the Route Planning Area from engineering, natural environment and built environment perspectives. After these suitability surface maps were used to assist in developing the preferred corridor for the transmission line, they appear not to have been used in analysis of alternative routes within the corridor. It might have aided the discussion of alternative routes and mitigative segments, during later stages in the process, if these routes and

segments had been depicted on the suitability surface maps. As for the phrase “least-cost path,” many readers of the EIS interpreted the term to refer only to financial costs, which caused a certain amount of misunderstanding. Again, it may be inevitable that a process of this nature will be complicated and difficult to explain. Manitoba Hydro had a large area with many different landscape types and communities to consider and had a large number of potential ways to cross this landscape with its transmission line. The challenge for the future will be to make such complicated processes as clear as they can be. In future route-selection exercises it may be useful for Manitoba Hydro to develop more clear and consistent terminology and simplified process descriptions in order to enhance understanding and public trust.

The panel acknowledges the criticism raised by one participant group that the 132 evaluated and weighted features in the EPRI-GTC Alternative Corridor Evaluation Model may have resulted in a dilution of some of the more important ones. The panel notes, however, that the nature of modern-day environmental assessment is that engagement with communities and individual stakeholders tends to raise more and more issues for consideration. It would have been difficult for Manitoba Hydro to reject some of the criteria recommended or suggested by various participants. As well, the panel acknowledges that the MMTP study area includes a diversity of environmental, social and economic values sprinkled across both private and Crown land. While the panel accepts that a large number of criteria were used, resulting in some dilution, the panel did not see how that resulted in poor routing decisions. The alternative routes and the preferred route were all substantiated by logical and substantial evidence, taking into account the geographical context. The same participant also made the point that after the border crossing point was moved to the east late in the process, some previously eliminated

routes ought to have been brought back for consideration. While it is difficult to see how these particular routes (which traverse more wetland and forest land and cross over the existing M602F transmission line) could have been selected, the principle does seem valid. If a fundamental parameter of a selection process changes, it may be necessary to re-examine decisions that have already been made in that process.

In the future, the panel suggests that the criteria in route evaluation models should be relevant to the specific study area under question. The criteria and their various preference rankings will and should vary depending on whether one is routing a transmission line through a rural, suburban, or wilderness setting. In the more remote or northern regions of the province it may be more suitable to only use a small set of criteria focused on large landscape level decisions (e.g. caribou habitat or community area boundaries) for the evaluation model. Avoidance of smaller, more site-based considerations (such as individual homes or buildings or specific environmental features such as an eagle’s nest) can likely occur in a later stage of route siting, by shifting the line to avoid such features. In the future, Manitoba Hydro should give consideration to the number and relevance of criteria used in models, taking into account the geographical context.

The panel heard from some participants and presenters that, despite the numerical precision of the EPRI-GTC method, it is not objective because the weightings applied to different criteria are still subjective. The EPRI-GTC method makes use of many objective factors, from the number of residences or farms within certain distance of the ROW, to the area of various kinds of natural habitat. But some scores are made based on the judgement of Manitoba Hydro employees, such as community ratings in the

Preference Determination Model, in which the range of community responses is given a numerical score. As well, all of the scores for individual criteria, whether based on quantifiable objective facts or judgement calls, are subject to the judgement that went into the weighting system. Therefore, it was argued, the EPRI-GTC process does not meet the goal of a more objective route-selection process that was set out in the commission's Bipole III report. The panel agrees that judgement calls were still a major factor in route selection for the MMTP, but considers that to be inevitable in any case in which humans must make decisions that reflect values. The process of selecting a transmission ROW is by its nature an art and a science. The science is perhaps the easier part, being based on measures of biophysical systems and known engineering practices. The more challenging art of the process is making informed judgements when knowledge is imperfect, where uncertainty is present, where competing interests must be adjudicated and when broad societal values must inform the choice of relevant criteria and the weight to be given to them. Selection of a transmission line route, and indeed any other decisions regarding the development of public resources and lands, will require analysis and decisions based on values that will conflict in whole or in part. Therefore, a purely quantifiable, objective system would be impossible. The EPRI-GTC process appears to balance the objective use of quantifiable data and the judgement of experts with knowledge of the planning area, influenced by a substantial effort to gain detailed input from diverse interests. Where subjective judgement calls were made, for the most part, Manitoba Hydro was transparent in showing how these decisions were made and how the various interests and values came into play.

Ultimately, the statistics of the FPR point to the complex balancing of interests involved

in the route-selection process. Out of 213 kilometres of ROW, 92 will be on existing transmission corridors already used by Manitoba Hydro. Of the 121 kilometres of new ROW, 30 per cent (36 kilometres) will be on Crown land. Crown lands are not without value simply because they appear to be unoccupied. They have great value for First Nations and Metis people and, as well, great value for the ecological services they provide to all Manitobans and Canadians. Crown lands provide the basis for Canada's efforts to protect biodiversity. Overall, in the process of selecting the MMTP route, it appears that Manitoba Hydro has understood these values and has attempted to balance them judiciously. Regarding the 85 kilometres of the new ROW that will traverse private land, the panel was made aware in a number of presentations of the impacts of a transmission line on private landowners' use and enjoyment of their land. Although it is inevitable when routing through an agricultural and rural residential areas that there will be some impacts, it appears that Manitoba Hydro developed a large number of alternate segments to reduce and minimize these impacts.

For the MMTP, Manitoba Hydro has selected a route that uses a combination of privately owned land and Crown land and lands already owned or under easement by Manitoba Hydro itself. Selection of the preferred MMTP route was inherently difficult in an age in which environmental, social and economic considerations need to be carefully balanced. Both Manitoba Hydro and the government of Manitoba are officially committed to the principles of sustainable development, which by definition balances environmental, economic and social values. Manitoba Hydro appears to have applied these principles in its route-selection process.

Non-Licensing Recommendations

The commission recommends that:

- 7.1 Manitoba Hydro, in its future transmission line route-selection processes, involve Indigenous representatives and community, landowner and consumer representatives in early engagement sessions used to develop evaluation models and define route-planning areas, alternative corridors and routes, as well as to identify baseline studies.
- 7.2 Manitoba Hydro take into account the full range of natural values and traditional uses of Crown land and private land in route selection.
- 7.3 Manitoba Hydro add an eighth route-siting principle designed to avoid or limit effects on areas of interest to Indigenous communities.
- 7.4 Manitoba Hydro use consistent terminology and descriptions to make its future route-selection processes easier for non-specialists to understand.
- 7.5 Manitoba Hydro incorporate a re-assessment process into future applications of the EPRI-GTC methodology so that eliminated route options can be reconsidered if there is a significant change in a fundamental parameter, such as the border crossing location in this instance.



Chapter Eight

Effects Assessment (Biophysical)

8.1 Overview

The Environmental Impact Statement (EIS) for the Manitoba-Minnesota Transmission Project assessed potential impacts of the project on three broad valued components (VCs) of the biophysical environment: fish and fish habitat, wildlife and wildlife habitat, and vegetation and wetlands. This approach was a change from that used in the EIS for the Bipole III Transmission Project and the Keeyask Generation Project, in which many specific animal species and physical characteristics of land and water were chosen as VCs. For the MMTP, rather than list (for example) elk, black bear or sharp-tailed grouse individually as VCs, Manitoba Hydro assessed all aspects of wildlife and wildlife habitat as a single VC. Within that VC, Manitoba Hydro conducted studies of elk, black bear and sharp-tailed grouse (among other species) to assess potential impacts.

Existing studies, regulatory guidance, desktop analysis of various data sources, input from the Public Engagement Process (PEP) and First Nation and Metis Engagement Process (FNMEP), key person interviews and field studies were used to determine how each of the three biophysical VCs would be assessed and what specific indicators would be chosen for assessment. For each VC, Manitoba Hydro considered the cumulative effect of the MMTP in combination with other projects

that are currently under way in the area or expected to occur in the foreseeable future. Projects considered in this cumulative effects assessment included other transmission lines, pipeline construction, highway widening and residential developments. For each of the three VCs, Manitoba Hydro concludes that there would be no significant effect as a result of the project.

8.2 Fish and Fish Habitat

8.2.1 Overview

The project crosses the Assiniboine and Red Rivers and several sub-watersheds of the Red River Basin: the La Salle River, the Seine River, Cook's Creek/Devil's Creek, the Rat River and the Roseau River. The transmission line Final Preferred Route (FPR) crosses 75 watercourses, including rivers, streams, creeks and agricultural drains. Of these watercourses, 31 are potentially fish-bearing. Nine species of conservation concern (SOCC) may inhabit the watercourses to be crossed by the line. The three station sites where work will be carried out as part of the project – Dorsey, Riel and Glenboro South – are not within 30 metres of any watercourses. Because they are not near any watercourses, no further assessment of the three station sites was carried out, and all the focus for this VC was on the transmission line.

Endangered, Threatened and Species of Conservation Concern

A number of terms are used in this chapter in the discussion of the conservation status of animals and plants. These terms are defined in law and establish the degree of concern for the species. *The Endangered Species and Ecosystems Act* in Manitoba (often referred to as MESA) and the federal *Species at Risk Act* (SARA) establish legal protections for species listed as endangered (the highest threat level) or threatened. Endangered species are those that are threatened with "imminent extirpation or extinction." Threatened species are those that are likely to become endangered if "factors leading to endangerment are not reversed." The term "species of conservation concern" includes those that are listed under MESA or that have been given a special designation by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), as well as other species that are rare, disjunct or at risk throughout their range or in Manitoba and that are in need of further research. In Canada, each province's Conservation Data Centre ranks species of conservation concern on the basis of their global and provincial status. Species are given a ranking of one through five, with one meaning that the species is very rare throughout its range or in the province (five or fewer occurrences) and may be especially vulnerable to extirpation. A ranking of two indicates a species that is rare (five to 20 occurrences) and vulnerable to extirpation. A ranking of three indicates a species that is uncommon throughout its range or in the province (21 to 100 occurrences). A ranking of four indicates a widespread, abundant species that is apparently secure but of long-term concern. A ranking of five means that the species is widespread, abundant and secure and "essentially impossible to eradicate under present circumstances."

Both federal and provincial legislation governs protection of fish and fish habitat. Within the watercourses crossed by the transmission line, species are protected by the federal *Fisheries Act*, which provides for the protection of fish that are within a commercial, recreational or Aboriginal fishery. This protection applies both to the species that are fished for and the species that support the health of the fishery. The federal *Species at Risk Act* (SARA) provides the basis of protection for both aquatic and terrestrial species. Provincially, *The Endangered Species and Ecosystems Act* provides for the protection of species listed as endangered, threatened and species of conservation concern. Water quality of watercourses in Manitoba is protected under *The Water Protection Act*. The nine SOCC known or expected to occur in the Regional Assessment Area (RAA) for the project are banded killifish, bigmouth buffalo, bigmouth shiner, carmine shiner, chestnut lamprey, lake sturgeon, mapleleaf mussel, northern brook lamprey and shortjaw cisco.

A review of existing fish and fish habitat data was conducted for the project area and the quality of existing fish habitat at the 75 watercourses to be crossed by the FPR was confirmed through field study. The primary data source used to identify watercourses capable of supporting fish was a document published by the Department of Fisheries and Oceans (Milani 2013). This document classifies watercourses as Type A, B, C, D or E, with Type A-C considered to have potential to support fish. Crossings of Type A-C watercourses – 23 in number – were examined in the field research program for the EIS. A list of

fish species that could inhabit the watercourses was compiled using a review of government and scientific information. The habitat requirements of these species for spawning, rearing, over-wintering and migration were then considered. However, fish sampling was not conducted as part of the field assessment. A one-time field survey was conducted, rather than a multi-season survey. Sensitivity of the sites to sedimentation and turbidity as a result of disturbances was assessed. Watercourses that were examined in the field survey were categorized in one of five groupings, based on the Alberta Fish Habitat Manual:

- no defined channel (typically a low-lying depression that does not provide habitat for fish);
- ephemeral (a seasonally flowing unnamed watercourse);
- intermittent/spring (an intermittently flowing unnamed or named watercourse with a defined bed and banks);
- small permanent (an unnamed or named watercourse that likely flows throughout the year and has a channel less than five metres wide); and
- large permanent (an unnamed or named watercourse that likely flows throughout the year and has a channel greater than five metres wide).

Each of the 23 watercourses was also assigned a “habitat sensitivity” ranking of high, moderate, low or not fish habitat. Watercourses designated as high sensitivity were those supporting species of conservation concern, essential to sustaining a fishery, containing spawning or other habitat essential either to an SOCC or to a fishery, or those that are not resilient to disturbance or able to buffer temperature changes. Moderate sensitivity watercourses were those with a diverse fish

community, used by one or more species of a fishery, or for which a large amount of similar habitat is available elsewhere. Low sensitivity watercourses were those with poor spawning or rearing habitat for fish, with limitations such as low flows or no overwintering capacity, typically supporting only forage species of a fishery, contributing only indirectly to a fishery, and often ephemeral watercourses that might not provide habitat for fish to complete one of their life processes but might provide occasional habitat during times of high water. Watercourses identified as not fish habitat were those that made no direct or indirect contribution to downstream habitat.

In order to assess the potential effect of construction of the project – particularly clearing of vegetation – Manitoba Hydro examined the type of land cover within 30 metres of the high water mark of each watercourse. Land cover types with a low contribution to fish habitat quality are agriculture (both cultivated and pasture), developed (including roads, industrial land, railways and buildings) and native grassland. Land cover types providing a moderate contribution to fish habitat are wetland and shrubland, as the latter provides moderate amounts of shade and channel stability. Land cover types providing a high contribution to fish habitat are hardwood, softwood and mixed-wood forest, as they have established root systems to reduce erosion and provide shade.

Potential pathways for affecting fish and fish habitat were identified as:

- change in fish habitat, resulting from direct loss of riparian vegetation via clearing, which could increase sedimentation and erosion, change water quality and change access to spawning, rearing, and overwintering habitats; and
- change in fish mortality or health, resulting from increased recreational fishing,

increased erosion and sedimentation, the use of herbicides and change in water quality parameters such as total suspended solids, dissolved oxygen, turbidity and water temperature.

8.2.2 Existing Conditions in Watercourses Crossed by the Project

Twelve of the watercourse crossings were at places of Type A fish habitat as classified by Milani (2013): Third Creek in the Assiniboine River area, the Assiniboine River, the La Salle River, the Red River, the Seine River near the Red River Floodway, Cooks Creek, Edie Creek in the Cooks Creek/Devils Creek sub-watershed, a Seine River tributary, the Seine River, the Rat River, and Pine Creek in the Roseau River sub-watershed. Eight of the watercourse crossings were ranked as high sensitivity: the Assiniboine River, La Salle River, the Red River, two crossings of Cooks Creek, the Seine River, a Seine River tributary, and the Rat River.

Species of conservation concern occur in the Local Assessment Area (LAA) near two of the watercourse crossings. At the Assiniboine River, lake sturgeon, mapleleaf mussel, black sandshell mussel, chestnut lamprey and silver chub occur. At the Red River, mapleleaf mussel, chestnut lamprey, silver chub and lake sturgeon occur.

Common fish species were identified for several of the watercourse crossings, including carp, channel catfish, northern pike, rock bass, stone cat, white sucker, bullhead, drum, sauger, shorthead redhorse, brook stickleback, central mudminnow, fathead minnow, Johnny darter, spottail shiner, tadpole madtom, troutperch, walleye, Iowa darter, blackside darter, finescale dace and white perch.

8.2.3 Changes to Vegetation at Existing Watercourse Crossings

Fourteen of the 23 watercourse crossings will require clearing of forest cover. Clearing of vegetation during construction of the transmission line is a potential pathway of effect for fish and fish habitat for several reasons. Tall trees at the water's edge provide cover for fish, provide shade that can moderate water temperature and provide habitat for insects that may be a food source for fish. Increases in water temperature can encourage microbial breakdown of organic matter, which leads to depletion of dissolved oxygen. Vegetation along watercourses provides material (leaf litter) that supports low-order stream communities that support other life in the watercourses. Riparian vegetation also prevents erosion and sedimentation. Therefore, clearing of trees can lead to more turbid water, which reduces the growth of algae and survival of aquatic insects. Siltation can also damage spawning grounds and, by decreasing the amount of light penetrating the water column, lead to reduced growth of water plants, which provide habitat for many fish.

Several of the SOCC in the RAA, including those found in the Red and Assiniboine Rivers, would have the potential to be affected by siltation.

The three crossings with the largest amount of forest clearing required, all of which are rated as high sensitivity, are at the Assiniboine River (3.16 hectares to be cleared), the La Salle River (2.52 hectares) and the Red River (1.65 hectares). Other high sensitivity crossings requiring forest clearing are Cooks Creek South (1.05 hectares), a Seine River tributary (0.64 hectares), Seine River (0.74 hectares) and Rat River (0.68 hectares).

Manitoba Hydro predicts no significant effects on fish and fish habitat, in part because there will be no work carried on within any waterways and the closest transmission tower to any of the waterways will be 42 metres away.

Buffer zones around waterways, in which clearing is done by hand or by feller buncher and brush is allowed to remain, are among the measures intended to prevent erosion and sedimentation and degradation of fish habitat. A feller buncher is a piece of equipment with a long arm that can reach into an area, cut and remove a tree without the vehicle needing to enter the area.

What We Heard – Fish and Fish Habitat

The lack of fish sampling conducted as part of the assessment was noted by participants. One participant group raised concerns about the three endangered species (lake sturgeon, bigmouth buffalo and mapleleaf mussel) that occur in the Red and Assiniboine Rivers in the area of the project. The participant recommended that follow-up monitoring be done, particularly for these populations. Another participant noted that the route selected for the project has more stream crossings than the alternatives farther to the east, which travel east of the headwaters of the Seine and Rat Rivers.

Commission Comment – Fish and Fish Habitat

Overall, the characterization of the stream habitats, assessment of the project effects and proposed mitigation measures are generally comprehensive and complete. Although there are some information gaps, the proposed mitigation measures described previously should be adequate to address potential adverse effects.

8.3 Wildlife and Wildlife Habitat

8.3.1 Overview

The three stations to be upgraded as part of the project (Dorsey, Riel and Glenboro South) are all in already-developed areas and the small expansions of the stations' footprints will take place on land that is not intact wildlife habitat. Portions of the transmission line that will be on the already-developed Southern Loop Transmission Corridor (SLTC) and the Riel-Vivian Transmission Corridor (RVTC) have less potential effect on wildlife and wildlife habitat than those parts of the line requiring a new right-of-way (ROW). Those portions of the proposed new ROW that will traverse more intact areas of habitat have the greatest potential for effect. Only 2.9 per cent of the existing SLTC/RVTC corridor is considered wildlife habitat (forest, grassland, wetland or water), whereas 69.4 per cent of the new ROW is considered wildlife habitat. The majority of the RAA (defined for this VC as an area extending 15 kilometres on either side of the ROW) is not considered natural wildlife habitat: 47 per cent is used for agriculture, 15 per cent is developed (the RAA takes in much of the western and southern portions of Winnipeg) and 38 per cent is natural wildlife habitat.

The three most significant issues related to wildlife and wildlife habitat identified in the EIS were the potential for bird deaths caused by flying into the wires of the transmission line, the potential for increased wildlife mortality as a result of increasing access to remote areas and the potential for a reduction in available habitat.

A large variety of wildlife species occur in the project area. Forty-five species of conservation concern (SOCC) have the potential to occur within the RAA and 17 of these were observed during wildlife surveys in 2014. The EIS focused on 12 species or groups

of species as “focal species” for the evaluation of wildlife and wildlife habitat. They are:

- elk, selected because of concerns expressed that the project could affect the small Vita herd, whose range overlaps a portion of the RAA;
- white-tailed deer, selected because they are highly valued by resource users and concerns have been expressed that increased access resulting from the project could increase mortality;
- moose, selected because, although they are uncommon in the project area, their importance was expressed in Aboriginal traditional knowledge (ATK) studies and the FNMEP;
- black bear, valued by resource users and commercial outfitters;
- furbearers, selected because of their importance in the ecosystem and to resource users;
- bats, selected because two resident species (little brown myotis and northern myotis) are listed as endangered under SARA and MESA;
- open-forest birds, including the golden-winged warbler (listed as threatened under MESA and SARA), that have a habitat preference for open forest and forest edges;
- interior-forest birds, including the ovenbird, which may be sensitive to the loss and fragmentation of forests;
- grassland birds, including the sharp-tailed grouse, which have experienced widespread habitat loss across the prairies and may be sensitive to development;
- wetland birds, including sandhill cranes, ducks and geese, which may be more at

risk of collision with overhead wires;

- upland herptiles (a term that includes reptiles and amphibians), such as the red-sided garter snake, which may be vulnerable to disruption of their movement corridors during construction; and
- wetland herptiles, including the northern leopard frog, which is used as a representative focal species for wetland herptiles.

Potential effects on wildlife and wildlife habitat were assessed using information gathered through government and scientific literature, the PEP and FNMEP, key person interviews, desktop analysis of data and field studies. Desktop analysis used Forest Resource Inventory cover classes to estimate wildlife habitat availability. Field studies for mammals included a camera trap study, aerial winter track survey and elk breeding survey. Studies for birds examined breeding, nocturnal calls, migration, waterbird movement, grouse leks (mating areas) and bird-mortality surveys. Studies for herptiles included surveys of wetlands, roadside call counts and visual encounter surveys.

Federal and provincial legislation outlines steps for the protection of some of the species discussed in the EIS. The federal *Species At Risk Act* (SARA) contains provisions for the protection of endangered and threatened species and for their habitat. The federal *Migratory Birds Convention Act* provides protection for migratory birds, their eggs and nests. In Manitoba, *The Endangered Species and Ecosystems Act* (MESA) regulates the protection of threatened and endangered mammals, birds, reptiles, amphibians, fish and plants in Manitoba and promotes their recovery.

Potential effects on wildlife fall into two

broad categories: changes to habitat availability and changes in mortality.

8.3.2 *Species of Conservation Concern (SOCC)*

Fourteen bird SOCC were detected during 2014 surveys: least bittern, great egret, yellow rail, eastern whip-poor-will, common nighthawk, short-eared owl, peregrine falcon, eastern wood-pewee, olive-sided flycatcher, bank swallow, barn swallow, golden-winged warbler, pine warbler and bobolink. Three herptile SOCC were detected in 2014: northern leopard frog, eastern tiger salamander and common snapping turtle. Five mammal SOCC were listed as having the potential to occur in the PDA – American badger, grey fox, star-nosed mole, little brown myotis (bat) and northern myotis – but they were not detected during field surveys in 2014. Seven terrestrial invertebrates of conservation concern were described as having the potential to occur in the RAA, five of them associated with dune habitats like those in the Spruce Woods area north of Glenboro. No terrestrial invertebrate SOCC were detected during field studies in 2014.

8.3.3 *Mammal Focal Species*

The RAA contains a wide variety of habitats, including agricultural land, riparian forests, wetlands and forests, and is home to 57 mammal species, from mice and voles to large ungulates and predators. The greatest diversity of species occurs in the eastern part of the RAA, where natural wildlife habitat is more common, from Ste. Genevieve to Piney.

Manitoba has more than 7,000 elk, primarily in the Riding Mountain, Duck Mountains, Interlake, Porcupine Hills and Spruce Woods areas. A smaller satellite herd of 100 to 150 animals occurs near the town of Vita, about three kilometres southwest of the

RAA, and is known to occupy areas extending into northern Minnesota. Information from the FNMEP indicated that, while the herd is more often located to the west of the project area, elk are hunted south of the Watson P. Davidson Wildlife Management Area (WMA) and southeast towards Piney. Habitat fragmentation, particularly of Crown lands, is considered a threat to elk because it can lead to increased predation. In 2014 and 2015, Manitoba Hydro's consultants conducted aerial and baseline surveys for elk and elk sign (tracks, antlers, pellets and browse) and were unable to detect any within the RAA. They also were unable to detect bugling elk in rutting season within the RAA. In aerial surveys, 21 elk were observed 21 kilometres southwest of the Final Preferred Route (FPR) in 2014 and 14 were observed in the same general area 18 kilometres from the FPR in 2015.

While-tailed deer are widespread throughout much of Manitoba, including the RAA. They are concentrated in the eastern portions of the RAA, from St. Genevieve to Piney and in the Watson P. Davidson and Spur Woods WMAs. Deer habitat is a forest mosaic that includes low-growing shrubs and grasses, forest edges and riparian areas. They also use agricultural fields, especially hay fields, for grazing and use hardwood forests as over-wintering habitat. Threats to white-tailed deer include increased hunting pressure and predation resulting from increased access into their habitat.

The moose population in southeast Manitoba has declined significantly since the 1990s due to a variety of factors. The area south and southeast of Watson P. Davidson WMA, extending to Piney, was identified as containing moose habitat. Tracks were observed on two occasions during field studies, once between Lonesand Lake and the Rat River and once in the Watson P. Davidson WMA. A camera trap on the ROW for the M602F transmission line east of the FPR

recorded a moose. Habitat fragmentation and increased access resulting in increased predation and hunting are among the potential impacts on moose.

Black bear are widespread in the RAA, especially in areas of forest habitat. Participants in the FNMEP indicated that hunting of black bears is an important activity. As well, guided black bear hunting is a provincially regulated tourism industry, with five outfitters working within the RAA. Field studies identified bear activity near the alternative routes, along the existing transmission line M602F and in other forested parts of the RAA. Black bear populations are considered stable or stable-to-increasing in the RAA.

A total of 58 remote cameras were placed in locations in 2014 for a total of 7,022 camera-days, with 36 cameras placed along the areas being considered as alternative routes for the MMTP and 22 placed along the existing M602F transmission line ROW. White-tailed deer were photographed at 57 out of 58 locations and were slightly more frequently photographed along the ROW (although the difference was not statistically significant). Black bear were photographed at 46 of the 58 locations and were significantly more frequently photographed along the alternative routes than along the existing ROW. No elk were observed in any of the camera locations. The camera study also indicated greater species richness along the alternative route locations than along the existing ROW, as several small mammals and furbearers photographed along the alternative routes were not observed along the ROW. This supports the observation that white-tailed deer, as a species that thrives on edge habitats, readily make use of a transmission line ROW, but that bears or small mammals and furbearers may be less likely to do so.

Furbearers include small mammals such

as marten and muskrat and larger predators such as wolf and coyote. During aerial surveys, wolves and coyotes were commonly seen in the RAA, with wolves mainly in forested areas and coyotes in more open agricultural areas. Furbearers such as marten and fisher are associated with closed-canopy forest habitats and are more sensitive to fragmentation of forests. Marten were identified as valuable to resource users and sensitive to change in mature forest habitat.

Potential roosting and foraging habitat for bats occurs in the area where the transmission line crosses the Assiniboine and Red Rivers and in forest and wetland areas along other parts of the FPR. There are no abandoned mines that could be used as bat hibernacula in the RAA and, while there are some limestone caverns in the RAA, none is known to support hibernacula.

8.3.4 *Bird Focal Species*

Throughout the RAA, 225 bird species are known to occur. Of these, 163 were detected during field surveys in 2014. Among the habitat types surveyed, grasslands had the highest density of breeding birds, followed by wetlands, hardwood forests and softwood forests. Bird surveys were conducted along the alternative routes being examined for the project and along the existing M602F transmission line ROW. The existing ROW supported more species associated with forest edges or shrubs, suggesting that clearing of vegetation for the new ROW will favour these species. The EIS groups bird species associated with types of habitat in the RAA: open forest, interior forest, wetland, and grassland and prairie.

Most open-forest habitat within the RAA is found in the eastern portion of the area, from the RVTC south to the areas around the towns of Richer, La Broquerie, Marchand, Sandilands and Sundown. Some open-forest

habitat is found near the riparian forest along the Assiniboine and Red Rivers. Open-forest habitat includes forest edges, early successional forests, woodlots and both natural and manmade clearings. Among the open-forest species are least flycatcher, blue jay, American robin, yellow warbler, American goldfinch, turkey vulture, Cooper's hawk, great horned owl and ruffed grouse.

Interior-forest birds are associated with large patches of dense, closed-canopy forest north of Richer, east of Marchand and near the towns of Sandilands and Piney. Common interior-forest birds include red-eyed vireo, ovenbird, yellow-rumped warbler, white-throated sparrow, sharp-shinned hawk, great gray owl and spruce grouse.

Parts of the RAA from Ste. Anne to Sundown are on the northeastern edge of grassland and prairie bird breeding ranges, although most of the grassland habitat in the RAA has been modified by agriculture. Grassland birds include savannah sparrow, clay-coloured sparrow, western meadowlark, red-tailed hawk, American kestrel, sharp-tailed grouse and gray partridge. Three active sharp-tailed grouse leks, supporting about 25 grouse, were identified southwest of Ste. Genevieve and north and south of La Broquerie during 2014 spring lek surveys. All three are adjacent to the FPR. Seven other leks were identified within the RAA a greater distance from the FPR.

Wetland habitats in the RAA include Lonesand, Sundown and Richer lakes, and a variety of bogs, fens and marshes, as well as rivers and artificial features such as the Deacon Reservoir (near the Riel Converter Station) and Oak Bluff lagoon. Common wetland birds include sedge wren, swamp sparrow and red-winged blackbird. Surveys conducted during fall and winter migrations indicated concentrations of waterbirds at the Red and Assiniboine River crossings, near the Brady

Road landfill (which attracts a large number of gulls), at Deacon Reservoir and at Richer Lake, Lonesand Lake and Sundown Lake. The most common waterbird species were Canada goose, ring-billed gull and a variety of ducks.

To understand possible effects of a transmission line ROW on bird populations, breeding bird surveys were conducted in 2014 at 139 locations along the alternative routes and at 35 locations along the M602F transmission line ROW. The study found that breeding-bird density was significantly higher along the existing ROW in grassland, wetland, hardwood and softwood habitat types than in sites not on the ROW. However, the diversity of bird species appears to be lower along the existing ROW. For example, in hardwood habitats, 66 bird species were observed overall. Of these 66 species, 35 were only observed along the alternative routes, and four were only observed along the existing ROW. In softwood habitats, 50 bird species were observed, of which 20 were only observed along the alternative routes and seven were only observed along the existing ROW. This suggests that, by converting the entire ROW into a strip of grass and shrubland, transmission line construction may reduce diversity of bird species along the ROW, though it may not reduce bird populations.

8.3.5 Herptile Focal Species

Thirteen amphibian species and nine reptile species have the potential to occur in the RAA, including both the region surrounding the transmission line and the grassland and dune habitats in the RAA of the Glenboro South Station. Wetlands such as the Caliento and Sundown bogs and the rivers crossed by the transmission line provide breeding and overwintering habitat for frogs, toads, salamanders and turtles. Some species of herptiles require upland habitats,

including northern leopard frogs, which forage in grasslands near wetlands; eastern tiger salamanders (the prairie population of which is listed by COSEWIC as endangered), which overwinter in moist woodlands; turtles, which lay eggs in sandy soils; and red-sided garter snakes, which forage on the edge of wetlands but breed and overwinter in upland habitats. The EIS states that within the RAA, eastern tiger salamanders are found along the Seine River and during field surveys one was detected near Woodridge, east of the RAA. There are no known records of garter snake hibernacula in the RAA, but the areas around Lonesand and Sundown have the highest potential for them, based on the limestone geology and the abundance of snakes observed in the area. Turtle nesting areas exist west of Lonesand Lake and east of Sundown Lake.

8.3.6 Changes in Habitat Availability

The most significant change to habitat will result from clearing of the new portions of the transmission line ROW, where most of the estimated 550 hectares of forest and shrubland clearing will occur. Within the predominantly agricultural portions of the project area there will be some tree clearing at crossings of rivers such as the Assiniboine, Red and La Salle. Forest clearing will result in forest habitat being converted to grass and shrub habitat. This is likely to have the greatest effect on some forest-dependent birds and mammals, such as the ovenbird and the American marten. Approximately two per cent of available marten habitat will be lost within the LAA – the LAA for this VC being a strip two kilometres wide centred on the transmission line. Disturbances resulting from clearing the ROW have the potential to affect black bears, which typically choose den sites one to two kilometres from disturbances such as roads and trails. Black bears were observed several kilometres from the FPR, east of La Broquerie and Marchand in the area of an

existing transmission line, and west of the FPR in the Caliento Bog area.

Clearing of the ROW will temporarily remove 475 hectares of potential habitat for the golden-winged warbler, which is listed as threatened under SARA. Of this habitat, which occurs between Ste. Genevieve and Piney, 64 hectares are classified as high-potential and 40 as medium. Environment Canada specifically defines critical habitat in the recovery strategies for some species that are listed as threatened or endangered under SARA. For the golden-winged warbler, such habitat includes early successional deciduous or mixed-wood forests and forest edges, often associated with logging or utility corridors. One hundred and seventy-seven 100-square-kilometre blocks of land in southeastern Manitoba, the Interlake and near Dauphin are designated as places where such habitat is likely to be found. The FPR traverses five of these blocks of land. Loss of this habitat may be temporary, as new shrubs and herbs will regenerate in the ROW, and Manitoba Hydro expects only two hectares will be permanently removed. In order to preserve golden-winged warbler habitat, areas assessed as such will be cleared selectively during construction, with trees removed (by hand or with feller bunchers) but shrubs, herbs and other vegetation retained as much as possible. The edge of the ROW will be cleared in such a way as to create a “feathered” edge, rather than an abrupt straight line. Vegetation management will be carried out in a way that encourages greater diversity of vegetation, with a mosaic of grasses, herbs, shrubs and saplings.

Habitat fragmentation is another effect of the project where the new ROW will divide previously contiguous patches of habitat. Habitat fragmentation can disconnect breeding areas, overwintering areas and dispersal corridors for wildlife. Habitat connectivity is important in maintaining local and regional wildlife movements. Fragmenting forest areas may create

a barrier, making it difficult for some species to avoid predation. For the ovenbird, a species that favours forest interiors, fragmentation can increase the rate of nest predation and nest parasitism (when another species lays its eggs in the ovenbird nest) and decrease food availability, clutch size and nesting success. Ovenbirds prefer breeding habitats that contain at least 90 hectares of core habitat.

“Edge effects” can occur when there are abrupt changes in habitat types that may lead to increased risk of predation, reduced food availability, impacts on reproductive success or sensory disturbance. This can also lead to avoidance of the area and can extend 100 metres into the remaining forest. As well as these permanent effects of construction, the project will also cause temporary sensory disturbances (noise, light or movement) during construction, which may cause wildlife to avoid the immediate area.

The FPR traverses eight large habitat patches ranging in size from 710 to 12,064 hectares. Most of these are affected at or near one edge, leaving the largest area intact on one side and a smaller patch on the other side of the ROW. For example, the largest patch will be divided into one habitat area of 10,794 hectares and another of 1,118 hectares. The smallest of the eight large patches will be divided into one area of 642 hectares and a series of small patches of five to 19 hectares.

The total increase in fragmentation measured over the entire RAA is an additional 0.04 km of new linear disturbance per square kilometre. This amounts to an increase of 1.3 per cent over the existing disturbance level (2.39 km/m²). The RAA for wildlife and wildlife habitat is a strip 30 km wide centred on the transmission line.

Avoidance of habitat needed by many of the wildlife focal species was assisted by routing decisions that placed more of the

FPR on agricultural land rather than on the relatively intact Crown land in the eastern part of the RAA. For example, for American marten, habitat in the RAA is concentrated east of the Watson P. Davidson WMA on Crown land.

Buffer zones and setbacks will be used during construction to reduce potential effects on sensitive sites for wildlife. Buffers are work areas where only low-impact clearing activities are permitted, such as hand clearing or clearing using feller bunchers. Setbacks are areas where no work is allowed without authorization by a senior environmental assessment officer. Should bear dens be located near the PDA, a 150-metre buffer zone and a 50-metre setback will be maintained. Should snake hibernacula be found, a 200-metre setback will be used. Breeding ponds for northern leopard frog will have a 30-metre setback and a 30-metre buffer for ROW clearing. Breeding and nesting sites for the birds listed in the EIS will have setbacks, during times of non-frozen ground, of 100 to 1,000 metres.

By allowing for increased access into previously less travelled areas, the ROW has the potential to reduce habitat availability. It is noted in the EIS that existing ROWs in the area have been used by all-terrain vehicles (ATVs) and snowmobiles, and that fires have been triggered by ATVs in the area.

8.3.7 Changes in Mortality

Changes in mortality are possible as a result of collisions with vehicles during construction and maintenance, destruction of ground-dwelling or ground-nesting animals during construction and maintenance, increased hunting or predation as a result of increased access made possible by the project and the potential for bird deaths from striking the wires.

Restricted-access timing windows for construction and placing buffers around large stick nests and active burrows are intended to reduce mortality risks associated with construction. Carrying out clearing, line stringing and other tasks in winter reduces mortality risk, since migrating birds are not present. However, in some cases, construction could cause the death of small mammals or herptiles in their overwintering burrows. Employing buffer zones around waterways, in which line clearing will be done by hand or with feller bunchers, reduces the mortality risk for burrowing herptiles. Carrying out much of the construction in winter also reduces the potential for collisions with wildlife as this is the time when they are less active or hibernating. There will be some potential for such collisions, however.

Mortality resulting from increased access may result if hunters use the ROW or access routes to hunt in areas that were previously less accessible. Along most of its route, the ROW travels through areas with plentiful existing access, but in some areas it will increase access into remote forests or wetlands. Fourteen kilometres of the line will traverse previously remote areas of dense forest. During field studies, wolves were detected along the existing M602F transmission line. The ROW may therefore improve access to prey for predators such as wolves, coyotes and foxes. This could in turn lead to increased predation on small mammals, furbearers, ground-nesting birds and ungulates. Transmission towers can also be used as perching sites by birds of prey, which increases their ability to prey on small mammals or other birds along the ROW.

The transmission line poses a potential risk of increased mortality for birds, especially large-bodied waterfowl and waterbirds, which often fly during low-light conditions at dawn and dusk. The risk of transmission lines for

birds is greatest when the lines are close to features such as lakes, rivers and wetlands that are used by large numbers of birds during migration or nesting seasons. Manitoba Hydro carried out bird-wire strike studies in preparing the EIS. Field studies identified seven areas with concentrations of waterbirds: the Red and Assiniboine Rivers, both of which are crossed by the FPR, Deacon Reservoir (120 metres from the FPR), Lonesand Lake (200 metres), Richer Lake (730 metres), the Brady Road landfill (1,000 metres) and Sundown Lake (1,200 metres). In these areas, where migrating waterbirds gather, and where there are breeding sites, collisions are a risk, although the EIS states that research shows most bird-wire strikes occur within 400 metres of water. In addition to the more common ducks, geese and gulls, sandhill cranes breed in some of the large wetland habitats in southeastern Manitoba in the Local Assessment Area.

In order to reduce this risk, Manitoba Hydro will use bird diverters on the wires to make them more visible to flying birds. The skywire – the smaller wire connecting the tops of the towers to provide protection from lightning strikes – may be a greater danger to the birds than the larger and more visible conductors. Manitoba Hydro states that studies of the use of bird diverters on skywires show that this practice reduces bird deaths by 45 per cent.

Transmission lines also pose a hazard to peregrine falcons. In a multi-year study of the dispersal and distribution of peregrine falcons in Manitoba, carcasses of 16 falcons equipped with transmitters were recovered, five of them in the vicinity of transmission or distribution lines in Manitoba or North Dakota. The transmission line will pass within a short distance of the Parkland Mews falcon recovery facility near the La Salle River, where injured and orphaned falcons are trained for release into the wild.

In order to minimize increases in human-caused mortality, Manitoba Hydro will remove temporary access roads and trails created for construction of the project. During construction, hunting by employees staying at camps will not be permitted.

What We Heard – Wildlife and Wildlife Habitat

One participant cautioned that research from around the world has shown that mitigation efforts are not always successful. The witness cited bird diverters and reduced-risk timing windows for construction as techniques that don't eliminate all impacts. Because these techniques don't always mitigate impacts, the witness said, it is essential to follow a precautionary principle in planning and assessing projects.

Representatives of Indigenous participant groups spoke about the impact on wildlife populations resulting from gradual decline of natural habitat in the region. One witness said elders had indicated that as a result of loss of forest land, resource users have had to travel farther to find moose and deer. Another spoke of declining populations of songbirds. The decline of moose populations in the region was attributed by one participant to loss of habitat and to brain worm. This witness also noted that bobcat is a species found in the region that was not discussed in the EIS.

Commission Comment – Wildlife and Wildlife Habitat

Perhaps because so much time and effort was taken in the route-selection process, and so many alternative routes and route segments were considered, the amount of field study of the Final Preferred Route included in the EIS was somewhat limited for a project of

this size. This leads to a degree of uncertainty in assessing potential effects of the project. The panel notes that there was no study of bats and no targeted survey of the eastern tiger salamander, although one eastern tiger salamander was noted during other field studies some distance from the FPR. Targeted surveys appear not to have been completed for two bird species at risk: the least bittern and the short-eared owl. As well, lack of access to private land may have impeded the ability of Manitoba Hydro to conduct field studies of wildlife and wildlife habitat in the portions of the ROW that traverse private land. The panel recommends that field studies of salamanders and other herptiles, as well as expanded field studies of bird species, be conducted.

There were also no field studies of the mottled duskywing, a butterfly SOCC that lives in the pine forests east of the FPR. Since some portions of the FPR, such as near Lonesand, are close to areas of coniferous trees, Manitoba Hydro should also do field surveys for this species.

Manitoba Hydro's own research indicates that converting forest to grass-and-shrub covered ROW does change the suitability of ROW for some species. Bird studies indicate that, while the density of total birds does not decline when forest is converted to ROW, the diversity of species does. The lack of smaller furbearers detected in camera trap studies points to a similar effect. Transmission line ROWs are suitable for edge species such as white-tailed deer, but less so for species that are dependent on closed forests. Therefore, while Manitoba Hydro's plan to manage and maintain portions of the ROW as a shrub habitat suitable for the golden-winged warbler is a positive step, it will not reduce effects on all species. Manitoba Hydro should attempt to maintain or re-establish forest habitat wherever it will not conflict with the reliability requirements for the transmission line.

Manitoba Hydro has stated that it will collect more data in areas of higher potential and concern, such as candidate protected areas. Before any construction in areas where tiger salamander habitat can be damaged, Manitoba Hydro should conduct targeted studies. Manitoba Hydro stated that tiger salamanders will be detected during surveys conducted for other amphibian species, but those methods are unlikely to be effective. Unlike the northern leopard frog, the tiger salamander overwinters underground rather than in ponds. The preferred survey techniques for tiger salamander include searching ponds in spring for breeding tiger salamander adults and egg masses, or searching for larvae in summer.

The most significant long-term effect on wildlife and wildlife habitat is likely to be a result of increased access, particularly in less developed and Crown land areas crossed by the ROW. The MMTP is relatively close to Winnipeg, with its growing population of more than 700,000, and many of the rural municipalities traversed by the ROW have relatively dense populations that are growing rapidly. Without effective controls on access to the ROW and monitoring of these effects, increased use of ATVs and snowmobiles along the new ROW will likely lead to damage to shallow and intermittent streams, increased noise and dust and increased hunting pressure on focal species such as white-tailed deer.

In parts of its assessment of effects on wildlife and wildlife habitat, Manitoba Hydro has demonstrated a substantial commitment to the environment. The plan for clearing and maintaining the ROW in areas of golden-winged warbler habitat has the potential to replace or enhance habitat for this species. By “feathering” the edge of the ROW and encouraging growth of an understory of shrubs, this plan may

enhance habitat for other species as well, although this will still be a change in habitat type. It should be acknowledged, though, that it will take several years for this new habitat to establish itself in the ROW. Continued monitoring and active adaptive management will be necessary to ensure that this habitat plan can be modified in order to achieve its goals. If this plan is successful, it may become a model for reducing negative effects of the ROW on the environment and increasing the potential for a positive contribution.

During the hearings, the panel heard discussions of the idea that project proponents should move beyond reducing negative impacts and should, instead, seek to make positive contributions. The panel urges Manitoba Hydro to find ways in which it can make a positive contribution within the Project Study Area, both by creative enhancement of the ROW, support for research, and other projects, such as support for reforestation or habitat development projects. The panel notes that it is aware that other North American and European jurisdictions are managing ROWs for more limited vegetative impact and increased habitat diversity, (Yahner and Hutnik, 2005).

Licensing Recommendations

The commission recommends that:

- 8.1 Manitoba Hydro conduct field surveys of the eastern tiger salamander and mottled duskywing butterfly, in areas of likely habitat, prior to construction.
- 8.2 Manitoba Hydro expand point-count and breeding bird surveys, to include the least bittern and the short-eared owl, prior to construction.

Non-Licensing Recommendations

The commission recommends that:

- 8.3 Manitoba Hydro continue to develop methods for enhancing habitat along transmission line ROWs.
- 8.4 Manitoba Hydro support reforestation or other habitat development projects within the Project Study Area.

8.4 Vegetation and Wetlands

8.4.1 Overview

Native vegetation and wetlands help maintain biodiversity and healthy ecosystems. They provide wildlife habitat and support human activities such as recreation and collection of traditional plants. Components of this VC are native vegetation, wetlands, rare plant species and traditional-use species. Native vegetation includes forest, shrubland and grassland communities. Wetlands are lands with poorly drained soils, water-adapted vegetation and biological activity dominated by water that is usually less than two metres deep and may be much shallower. Rare plants typically occur in areas of remaining native vegetation or in specific uncommon wetland habitats and are often of particular conservation concern. Traditional-use plant species include both those that are rare and others that are widely available. Information about traditional-use plants was gathered through the FNMEP and the various ATK and traditional land and resource use studies. Plant species at risk are protected provincially under *The Endangered Species and Ecosystems Act (MESA)* and federally under the *Species at Risk Act (SARA)*.

In the Regional Assessment Area, wetlands and native vegetation have been disturbed since the 19th century by water drainage, conversion

to agriculture and development. Many wetlands, especially in the western part of the RAA, have been drained through the construction of artificial channels. Native vegetation covers 596 hectares and wetlands cover 458 hectares out of the total 3,161 hectares in the project footprint. Intact native vegetation and wetlands are more common along the southeastern portion of the proposed new ROW.

As with the wildlife and wildlife habitat VC, wetlands and native vegetation were assessed with an LAA that extended for one kilometre on each side of the ROW and station projects and an RAA that extended for 15 kilometres on each side.

8.4.2 Native Vegetation

The EIS for the project identified six classes of native vegetation, with deciduous forest as the most common, in the PDA, LAA and RAA. Manitoba Hydro used detailed aerial photography to map the locations and amount of the six native vegetation classes within the PDA.

- Grasslands are composed of native prairie grasses or mixed native and tame grasses and herbs, which may include scattered stands of shrubs such as willow, chokecherry, Saskatoon and pincherry and may be upland or lowland types. There are 57 hectares of grassland in the PDA.
- Shrublands are dominated by woody, multi-stemmed plants three metres high or lower, including willow, wolf willow, snowberry, prairie rose, beaked hazelnut, Saskatoon, meadow sweet and chokecherry. There are 25 hectares of shrubland in the PDA.
- Deciduous forests have 75-100 per cent of the canopy composed of broadleaf/deciduous or hardwood trees, including

aspen and birch. There are 278 hectares of deciduous forest in the PDA.

- Coniferous forests have 75-100 per cent of the canopy composed of coniferous or softwood trees, such as jack pine or spruce. There are 85 hectares of coniferous forest in the PDA.
- Mixed-wood forests have 26-74 per cent of the canopy composed of a mix of coniferous and broadleaf/deciduous trees. There are 150 hectares of mixed-wood forest in the PDA.
- Sand dunes are sand-dominated uplands that can include shrub or grass species or be barren with limited vegetation. Within the project area, this class of native vegetation occurs only in the RAA of the Glenboro South Station. There is no dune land in the PDA.

Project effects on vegetation were assessed by considering landscape intactness, impacts on land cover classes (particularly those that are less common) and the potential to introduce invasive species.

Within the existing corridor portions of the ROW, intact native vegetation consists primarily of small patches of natural habitat, mostly less than two hectares. Most of the intact native vegetation patches intersected by the proposed new ROW are larger than 200 hectares, a size identified by Environment Canada as critical for supporting biodiversity. The largest intact native vegetation patch to be intersected by the ROW consists of 2,687 hectares of the Sundown Bog. Other large patches include 1,097 hectares east of the Lonesand Area of Special Interest (ASI), 1,052 hectares east of the Watson P. Davidson WMA and an 815-hectare patch that includes Sundown Lake. (An ASI is an area that contains soil or surface geology features that create specific landscapes; while ASIs are not

necessarily protected, identification of them aids in establishing which areas are most critical for protection.)

Of the patches of grassland to be crossed by the ROW, one contains native tall-grass prairie species such as big bluestem, poverty oat grass and purple oat grass. Others are dominated by non-native species such as Kentucky bluegrass.

During field surveys for rare plants and wetlands, invasive plant species were documented at 36 locations in the PDA, with Canada thistle, common dandelion and quack grass the most commonly observed invasive species. Ten different invasive species were observed. The existing transmission corridor was the location for most of the invasive plants (27 locations) and about half of the occurrences were in disturbed areas, such as gravel pits, roads and ATV trails. The rare plant and wetland surveys targeted areas of intact vegetation, so there was less emphasis on searching for invasive plants in agricultural areas. Concerns about invasive plants in agricultural areas are discussed in Chapter Nine: Effects Assessment (Socio-economic) in the section on agriculture.

The new ROW will intersect 21 patches of native vegetation larger than 200 hectares. Most of the patches of native vegetation are dominated by forests, although one patch northeast of Richer is dominated by grassland. Forests intersected by the ROW will be permanently converted to grass or shrubland as a result of clearing. Invasive plants could potentially be spread as a result of construction vehicles transporting their seeds. As well, because invasive plants are habitat generalists, they often spread quickly on disturbed soil and can spread rapidly and out-compete native plants.

Measures to avoid or reduce effects on native vegetation include: clearing the ROW

during frozen or dry conditions to reduce rutting and erosion; limiting grubbing, a form of clearing that removes the roots of trees and shrubs, to the locations of the tower foundations and centre trails; carrying out weed control in accordance with the Rehabilitation and Weed Management Plan (see Chapter Twelve: Environmental Protection and Monitoring); felling trees toward the centre of the ROW to reduce damage to surrounding forests; and restricting contractors to established roads and trails in accordance with the Access Management Plan. In order to prevent the spread of invasive plants, biosecurity protocols will be implemented to keep equipment clean and free of soil or vegetation debris before being used on the project. Areas identified as having invasive plant infestations will be mapped and weed control will be undertaken. Where appropriate, regional native grass mixtures will be used to control erosion and prevent invasion of non-native species.

8.4.3 Wetlands

Wetlands make up 458 hectares, or 14.5 per cent, of the PDA, according to desktop mapping. Manitoba Hydro conducted this desktop mapping to gain a more accurate assessment of land cover within the PDA than available from the Forest Resource Inventory (FRI) database, which underestimates the amount of wetlands. The FRI database, which was used to estimate land cover in the RAA, includes swamps (which are treed wetlands) within the adjacent forest classes. The FRI database also under-represents marshes because small marsh wetlands located in agricultural areas are not included in the inventory. Most of the wetlands included within the PDA (335 hectares) occur within the proposed new ROW. The existing transmission corridor contains 123 hectares of wetland. One small marsh occupies 0.14 hectares of the area where the Dorsey Converter Station will be expanded. A small open-water wetland occupies

Defining Wetland Types

Marshes are characterized by fluctuating water levels, have vegetation dominated by grasses, sedges and herbs, and may receive water from run-off, groundwater discharge or precipitation. Fens are connected to both groundwater and surface water. They may be dominated by trees such as tamarack, black spruce and bog birch or by shrubs, willows, grasses, sedges and peat moss, and they accumulate peat. Swamps are forested wetlands dominated either by trees, such as tamarack and black spruce, or by shrubs, such as willow, dogwood and alder. Bogs may be open or have canopies of trees or shrubs and are dominated by sphagnum moss. They accumulate peat and are nutrient-poor, with acidic soil. They receive water from precipitation rather than surface water.

0.15 hectares in the area where transmission lines at Glenboro South Station will be realigned.

Large, intact patches of wetland occur at the southern end of the new ROW, including the Caliento Bog, which consists largely of marshes, treed bogs and shrub swamps, and the Sundown and Piney Bogs, which consist mostly of treed fens. Within the PDA, based on the desktop mapping in the EIS, marshes are the most common wetland type (250 hectares), followed in order by fens (93), swamps (88) and bogs (25).

Wetlands play a large number of roles in ecosystems. They may provide flood storage or prevention, water treatment, erosion prevention and habitat for rare plants adapted

to their unique habitats. Open-water marshes provide habitat for wildlife such as waterfowl. Wetlands that accumulate peat, in particular, sequester carbon and thereby play a role in preventing climate change.

Potential effects on wetlands come largely from vegetation clearing and from excavations for anchor points for towers. At the locations of guyed towers, an area of 100 by 100 metres will be grubbed to the ground and each guyed tower will require five excavations of about two square metres. Along the ROW itself, trees will be cut to a height of 10 centimetres, and a centre line approximately 20-22 metres wide will be bladed in treed areas. The centre line is used by vehicles travelling the ROW during construction and maintenance. Removal of vegetation could result in increased erosion. Soil disturbance from the excavation could result in some local changes to hydrology. Soil compaction and rutting caused by the equipment used in construction of the transmission line could also affect wetlands.

Measures to reduce impacts on wetlands include: clearing the ROW when the ground is frozen or dry in order to limit rutting and erosion; use of erosion-control measures such as construction mats; riparian buffers of at least 30 metres, where shrubs and small trees will be maintained and only clearing methods that do not disturb the soil will be used; directing surface water run-off away from disturbed areas, maintaining natural drainage patterns, use of temporary berms, ditches or fences between wetlands and disturbed areas; regular vehicle maintenance to detect any leaks of oil or other fluids and ensuring maintenance is done at least 100 metres from water. As well, by routing the FPR along the edge of the three large wetlands (Caliento, Sundown and Piney), effects on these wetlands will be reduced. As a result, Manitoba Hydro states that the only permanent loss of wetlands will be the 0.14 hectare wetland lost at the Dorsey station.

8.4.4 Rare Plants

Of the 14 plant species at risk in Manitoba, three are recorded in the Manitoba Conservation Data Centre (MCDC) within the RAA: Great Plains ladies' tresses, Riddell's goldenrod and rough purple false-foxglove. Great Plains ladies' tresses has been recorded in pastures and adjacent to roads, railways or trails. Riddell's goldenrod has been recorded in mixed-wood forest, pastures, cleared and cultivated land and adjacent to roads, railways and trails. Rough purple false-foxglove has been recorded in mixed wood forest, grassland, pastures and adjacent to road, railways and trails. None of these species at risk was observed in the PDA or the LAA during field surveys.

The MCDC database has records of two species of conservation concern (SOCC) within the PDA: arethusa and ram's head lady's slipper. Four additional SOCC have been recorded within the LAA: false indigo, white boltonia, dog violet and green needle grass. Within the RAA, 62 plant SOCC have been recorded, mostly herbs or grasses/sedges.

Field surveys conducted for the project in 2014 found additional SOCCs within the PDA, though they are not listed as species at risk. These plants include one tree (black ash, found in five locations), moonseed (a vine) and compact groundsel (an herb). Manitoba Hydro stated that it conducted 103 100-metre-long transects along the alternative routes as part of its rare-plant survey, 45 in June 2014 at the time of early blooming and 58 in August at the time of late blooming. Of these transects, 56 were in the LAA, but not necessarily within the area to be cleared for the ROW. Manitoba Hydro stated, in response to an information request, that more data will be gathered in gap areas, such as in potential candidate protected areas.

Clearing of the ROW, especially adjacent to towers where grubbing will be used, has

the potential to disturb rare plants. To address uncertainty regarding the presence of rare plants in the actual area to be cleared, Manitoba Hydro will conduct pre-construction surveys for both rare plants and invasive plants. The Construction Environmental Protection Plan (CEPP) will include buffers for sensitive sites, which will include locations of SOCC, which either will not be cleared or will be cleared by hand or feller buncher.

8.4.5 Traditional-Use Plants

The RAA includes many plants that are traditionally harvested for food, medicinal or cultural purposes, 39 of which were identified along the PDA during the rare plant surveys in 2014. The self-directed ATK study conducted by Black River First Nation, Long Plain First Nation and Swan Lake First Nation indicated that of 300 plant species identified during field surveys, 95 per cent are considered medicinal plants. Traditional-use plants were recorded in 35 locations along the new ROW and 26 along the existing corridor, including areas of Crown land and privately owned land. They were also observed in the PDA at the Dorsey Converter Station.

Many of these traditional-use plants are quite common. Among the most frequently recorded traditional-use plants in the PDA were wild raspberry (seven locations), wild sarsaparilla (six locations), choke cherry (six locations), dewberry (five locations), red osier dogwood (five locations), two-leaved Solomon's seal (five locations), beaked hazelnut (four locations), Saskatoon (four locations) and Canada goldenrod (four locations). Traditional-use plants were detected in pastures, along roads, railways and trails, in deciduous and mixed-wood forests and shrubland.

ATK and traditional land and resource use studies that were included with the EIS also discuss traditional-use plants found in areas that had been considered for alternative routes during

the route-selection process. Near Marchand there are areas for harvesting of traditional-use plants, including weke (a wetland plant also known as sweetflag). Sensitive cultural-use plants also occur near Piney, in an area now avoided because of the move of the border crossing 6.6 kilometres to the east. ATK and traditional land and resource use studies also indicated clusters of traditional-plant use to the east of the Watson P. Davidson WMA and in the vicinity of the community of Woodridge, both in areas avoided by the FPR.

Measures to limit effects on traditional-use plants are largely the same as those to limit effects on rare plants. Clearing will occur in frozen or dry conditions, contractors will be limited to established roads and trails, contractors will prepare erosion-protection and sediment-control plans, weed control will be carried out in accordance with the Rehabilitation and Weed Management Plan. In response to an information request from one participant, Manitoba Hydro stated that it is not feasible to transplant traditional-use or other plants that are found to be in the PDA, but it will apply mitigation measures such as buffering, to prevent damage.

What We Heard – Vegetation and Wetlands

While the FPR is proposed primarily to traverse privately owned land, including land used for agriculture, the relatively small loss of forest habitat caused by the MMTP was placed by several participants in the context of a long-term decline in the amount of undisturbed land in the area. One participant presented the results of a study that used historical maps and land cover data to estimate the decline in the amount of forest cover within the project area since 1930. The mapping expert who carried out the study digitized a map from 1930 that marked land cover and land use, as well as maps from 1968 and 1970 based on air photos. After digitizing these earlier maps, he compared them to more

recent land-cover and land-use data from 2001, 2005 and 2016 gathered through modern remote sensing and satellite technology. This allowed not just for an overall comparison of forest cover today with forest cover in 1930, but for an image of the pace at which forest cover declined during this time.

The mapping study indicated a substantial reduction in the proportion of Route Planning Area covered by forest. Forested areas amounted to 60.4 per cent of the area in 1930, 57.3 per cent in 1970, 48.2 per cent in 2001, 47.8 per cent in 2005 and 44.2 per cent in 2016. At some time around 2000, the area of non-forest land in the study area became greater than the area of forest land. For the purposes of the study, the term “forested areas” includes areas that have recently been logged or that have recently been burned in forest fires, so the actual proportion of the area covered by trees at any given time would be lower than the numbers above. Non-forested areas include both areas cleared for agriculture and large wetland complexes such as the Sundown, Caliento and Piney marshes. The aerial images indicate that a large block of forest east of the Watson P. Davidson WMA was burned or cut (perhaps in salvage logging) between 2005 and 2016. However, as this land has not been permanently converted to another land cover, such as for agriculture, it still counts as forest for the purposes of the study.

The study also looked at changes in the amount of linear disturbance on the landscape. In conjunction with the decline in the proportion of forest cover, the Route Planning Area has experienced a large increase in the total distance and area of linear features (roads, railways, transmission lines, etc). Linear features in the area amounted to 2,678.5 km in 1930, 4,174.8 km in 1970, 6,062.4 km in 2001, 6,903.8 km in 2005 and 7,033.3 km in 2016. Linear features fragment areas of habitat, can provide access for hunters or predators and can allow for the spread of invasive species.

Comparison of the maps over time shows that large areas of forest land were lost in the

western half of the study area. In the northwest of the study area, much of the conversion from forest to non-forest occurred between 1930 and 1970, leaving virtually the entire northwest corner of the area non-forested. In other parts of the study area, conversion of forest to non-forest continued throughout the period 1930-2016. Relatively large amounts of forest in the west-central portion of the study area, between the Watson P. Davidson WMA and the area around the villages of Grunthal and Barkfield, were converted to non-forest between 1970 and 2001. Smaller patches of forest have been converted to non-forest in the east of the Route Planning Area.

One participant provided a detailed, illustrated presentation on rare and traditional plants along the FPR. The witness described the botanical survey carried out in spring and fall 2014 for the ATKS Management Group, which focused largely on the area around Lonesand and further south. Of the 300 plants identified in this survey, at least 10 were endangered, threatened or plants of special concern listed as S1, S2 or S3 by the MCDC. The panel was shown photos of ladies' tresses, large pink ladyslipper, black ash, small evening primrose, hairy sweet cicely, slender-leaf false foxglove, wild ginger, narrow-leaf Jersey tea and the white turtlehead, described as Manitoba's only snapdragon, as well as other rare or traditional-use plants identified along the FPR. Many of these will be in the path of the ROW. As well, the FPR will go through what described as one of the last standing forests of black ash trees in Manitoba. The witness also stated that the final 40 kilometres of the FPR requires botanical study, because the survey was carried out before the border crossing was moved 6.6 kilometres to the east.

Another participant said the forest being lost as a result of clearing represents an environmental externality – a cost that is not being paid by the proponent but by society as a whole. Although relatively small, the forest's contribution to air and water purification, carbon sequestration and nutrient cycling will be lost.

Commission Comment – Vegetation and Wetlands

As with wildlife and wildlife habitat, it appears that the lengthy process of route selection and the large number of routes and route segments under consideration may have limited the amount of field study of vegetation and wetlands conducted within the Project Study Area. As in the previous section, access issues on private land may have prevented some study of traditional-use plants, rare plants and invasive plants. Overall, the plant sampling effort was poorly allocated, resulting in significant gaps in coverage. Survey locations were determined in the field (apparently by ease of access), rather than being stratified by habitat. While 56 transects were made in the Local Assessment Area, it is not clear how many were made within the area that will be cleared for the new ROW. The change to the border crossing made late in the process also meant that the southern portion of the LAA was not sufficiently surveyed for traditional-use and invasive plants. Manitoba Hydro has committed to further pre-construction surveys. More detailed surveys, using where possible Indigenous and local botanical knowledge, will help to identify sensitive sites for environmental protection. The panel is of the view that further plant surveys, including surveys of traditional-use plants, invasive plants and endangered plants, must be conducted along the southern part of the route, prior to construction activity.

The panel notes as well that the habitat classes used for this VC were relatively “coarse.” The categories “deciduous,” “coniferous” and “mixed wood” are not detailed, with no distinction by species or age. The “grasslands” class includes native grasslands as well as cleared forest and degraded /invaded grasslands. The same classes were used to categorize wildlife habitat.

The use of such coarse vegetation classes reduces the ability to assess the impacts on vegetation and wildlife, especially when inadequately validated with field data. The use of

a finer-scale classification, incorporating species composition, stand age and soil conditions, would have been much more appropriate. However, ecological land classification data are not readily available (i.e. not incorporated into the Forest Resource Inventory database) in southern Manitoba. While this issue remains a shortcoming, there is no ready solution.

The panel notes that the emphasis on large patches of intact habitat that will be traversed by the ROW may neglect the value to the environment of smaller patches of habitat. Even very small wetlands or grassland patches within the existing ROW may be capable of supporting some rare plants or may provide valuable habitat.

The issue of ATV and snowmobile access along the ROW is raised in the EIS in regards to this VC as well. The potential exists for increased motorized access along the ROW to lead to erosion, spreading of invasive plants, damage to rare and traditional-use plants and forest fires. This potential impact on the environment will need to be monitored and may require additional preventative actions. This will be discussed at greater length in Chapter Twelve: Environmental Protection and Monitoring in reference to access management.

Licensing Recommendation

The commission recommends that:

- 8.5 Manitoba Hydro expand traditional-use and invasive-plant surveys, with input from Indigenous and local knowledge holders, prior to construction, to include areas within the Local Assessment Area on Crown and private land that were not sampled or that were insufficiently sampled in preparation for the EIS. An example would be the area affected by the change to the Piney border crossing.

Chapter Nine

Effects Assessment (Socio-economic)

9.1 Overview

Manitoba Hydro assessed the effects of the Manitoba-Minnesota Transmission Project (MMTP or the project) on nine valued components (VCs) of the socio-economic environment: traditional land and resource use; heritage resources; infrastructure and services; employment and economy; agriculture; land and resource use; visual quality; human health risk; and community health and well-being. In the route-selection stage of the project, the socio-economic environment was referred to as the “built environment.”

Manitoba Hydro considered the potential effects on these VCs following application of mitigation measures. The environmental impact statement (EIS) also includes, for each VC, a cumulative effects assessment that considers other past, present and future activities within the region that could have effects that act cumulatively with those of the MMTP. For each VC, Manitoba Hydro concludes that there will be no significant negative impact.

9.2 Traditional Land and Resource Use

9.2.1 Overview

Eleven First Nations, the Manitoba Metis Federation (MMF) and four Indigenous organizations were invited to participate in the First Nations and Metis Engagement Process (FNMEP) in order to gather information and express concerns and interests regarding the project. Aboriginal traditional knowledge (ATK) and traditional land and resource use studies were carried out by several First Nations, either working independently or in partnership with others, plus the MMF. Manitoba Hydro made available a total of \$1.8 million in funding for such studies. Some of these studies were submitted before the EIS for the project was completed, and were used in the assessment of the project’s effects. Others were completed after the EIS was submitted and Manitoba Hydro has stated these will inform planning for the Environmental Protection Program (EPP) and continued monitoring. In addition to the information from the FNMEP and the traditional land and resource use studies, assessment of the effects on the traditional land and resource use is informed by the results of other chapters of the EIS. Information gathered for the assessment of effects on wildlife and wildlife habitat, vegetation and wetlands, and heritage resources also informs the conclusions in this

section (see Sections 8.2, 8.3 and 9.3). These processes allowed four key subjects to become the focus of the assessment of effects on traditional land and resource use:

- plant harvesting (for food, medicinal and cultural purposes);
- hunting and trapping (for food, economic and cultural purposes);
- trails and travelways (including trail systems, waterways used for travel and landmarks); and
- cultural sites (including burial sites, sacred sites, spiritual sites and sacred geography).

The Local Assessment Area (LAA) and the Regional Assessment Area (RAA) for traditional land and resource use were the same as for wildlife and wildlife habitat and vegetation and wetlands. The LAA extended one kilometre on each side of the transmission line and other project components, while the RAA extended 15 kilometres on each side. Although Manitoba Hydro states that there is not a significant effect on this VC, the EIS characterizes the effect on traditional land and resource use as “moderate” on the grounds that there are no established thresholds for effects on traditional land and resource use.

9.2.2 Plant Harvesting

Aboriginal traditional knowledge (ATK) and traditional land and resource use studies indicated a number of areas throughout the Project Study Area in which traditional-use plants are harvested. Some of these are along the new ROW near the western and southern edges of Watson P. Davidson Wildlife Management Area. Harvesting is and has been carried out southeast from the Watson P. Davidson WMA to the Spur Woods WMA and to Piney. Other locations in the RAA

were cited near La Broquerie, Marchand, Lonesand, Sundown, Sandilands Provincial Forest and St. Malo. Plants harvested include blueberries, plums, chokecherries, raspberries, blackberries, hazelnuts, wild ginger, sweetgrass, wild rice, yarrow, cedar, sage, Seneca root and mushrooms.

During Manitoba Hydro’s field survey, 39 traditional-use plant species were detected along the new ROW. In the FNMEP and ATK and traditional land and resource use studies, concerns were expressed that ROW clearing would remove traditional-use species and that clearing techniques that removed the roots of plants would prevent them from growing back. In many communities, the use of herbicides in vegetation management raises concerns. Manitoba Hydro applies buffer zones of 15 metres around sensitive sites, including traditional-use plants, where it will clear vegetation by hand or feller buncher in order to minimize disturbance to soil. For vegetation management in clearly identified sensitive sites that contain plants of importance to Indigenous harvesters, Manitoba Hydro states that it will consider non-chemical means. In several communities, it was said that community members no longer gather plants along transmission lines as plants growing near developments are considered not to have the same quality or value as those growing in undisturbed areas.

Manitoba Hydro states that the route-selection process reduced potential effects on traditional plant harvesting by locating much of the line on developed and agricultural land. Specific areas of concern near Marchand were avoided, as was an area of private land near Sundown. First Nations and the MMF will be given the opportunity to identify sensitive sites along the ROW to help inform the Environmental Protection Program for the project. Construction techniques that limit impacts on vegetation – including minimizing the amount of grubbing, as well as limiting access

to established roads and trails – are intended to reduce effects on traditional plant use.

9.2.3 Hunting and Trapping

Concerns were expressed through ATK and traditional land and resource use studies about the potential for effects on the moose population and moose habitat, in part because of increased access to hunting areas made possible by the ROW and the access trails. It was noted as well in these studies that some wildlife populations, particularly moose, are already reduced in the area. The ROW could increase predation of moose and other ungulates by wolves that use it for travel, and could allow recreational hunters to gain access to traditional hunting areas. A number of locations throughout the Project Study Area were mentioned as significant for deer, moose, elk and fur bearers: Sandilands Provincial Forest, Spur Woods WMA, areas on both sides of the Watson P. Davidson WMA, and areas near Caliento, Sundown and Piney. In addition to the potential loss of wildlife and wildlife habitat resulting from the project, some of the ATK and traditional land and resources use studies cited concerns held in Indigenous communities that vegetation near power lines is contaminated and so the meat of animals that feed near power lines would be affected. Sensory disturbance during operations and maintenance, caused by line noise and the presence of inspection and maintenance crews, was also raised as a concern. Many of the ATK and traditional land and resource use studies cited the cumulative effect of transmission line development combined with agriculture, forestry, residential development and other changes to the environment as a concern for community members.

As with effects on traditional plant harvesting, Manitoba Hydro states that the routing process reduced potential effects on hunting and trapping by avoiding areas

of intact forest in the eastern portion of the Project Study Area, including near the towns of Sandilands and Marchand and west of Sundown. Scheduling construction to avoid times that are sensitive for wildlife, such as calving and nesting, is another mitigation measure. Manitoba Hydro states that it will provide First Nations and the MMF the opportunity to identify sensitive areas for wildlife in order to inform the Environmental Protection Program for the project. Preconstruction surveys for stick nests, mineral licks and dens will be used to establish buffers.

9.2.4 Trails and Travelways

The RAA for the project includes a number of trails and travelways that were discussed in self-directed ATK and traditional land and resource use studies. Some of these include well-known routes from the fur-trade and settlement eras, as well as routes from the pre-contact period. These include the Dawson Trail, running east-west, and the Crow Wing Trail, running north-south. The rivers crossed by the ROW – including the Red, Assiniboine, La Salle, Seine and Rat – were also travelways for thousands of years. Participants in the FNMEP indicated that a variety of trails are used in the southern reaches of the proposed ROW, around the Watson P. Davidson WMA and southeast to Spur Woods WMA.

Potential disruption to trails and travelways could be caused by clearing for the ROW and for any access routes needed for construction and maintenance. Since trails and travelways are often used for traditional activities such as gathering plants for food or cultural purposes, the presence of the transmission line could result in people not using these routes anymore. Trails and travelways are also identified as cultural heritage features and may be associated with archaeological and historic resources. Consequently, disruption of trails and

travelways through clearing or construction could also affect heritage resources.

Manitoba Hydro anticipates that, because there is already a substantial amount of access, there will be little need to create new access trails for construction of the transmission line. Since a large portion of the line is on private land where access is already restricted by the owners, there is little potential for impact on trails and travelways in these areas. Those portions of the FPR with higher potential for heritage resources will be identified through the heritage resources assessment. First Nations and the MMF will be given the opportunity to identify sensitive sites to help inform the Environmental Protection Program for the project. A Cultural and Heritage Resources Protection Plan will be developed to safeguard such resources and ensure that any human remains or cultural resources discovered through the project are appropriately handled.

9.2.5 Cultural Sites

One known archaeological site exists in the PDA for the proposed new ROW and four previously recorded archaeological sites exist in the portions of the ROW that follow the existing transmission corridors. Many kinds of cultural sites exist in the Project Study Area from the Dorsey Converter Station to the Manitoba-Minnesota border at Piney. These include farms and cart trails along the Assiniboine and La Salle Rivers that date to the 1870s and pre-contact potsherds (remains of cooking or storage vessels) along the Seine River. In the eastern portions of the study area, archaeological sites are located in the Sandilands Provincial Forest and gathering areas for resource harvesting exist from Marchand to the Watson P. Davidson WMA and the Pocock Lake Ecological Reserve. An area with high potential for undisturbed heritage sites exists from the southwestern edge of the Watson P. Davidson WMA to Spur Woods WMA and south of Piney. Specific

heritage resources in the form of rocks with cultural and spiritual significance are found within the Project Study Area, but not near the PDA. Concerns have been expressed about burial sites, petroforms and rock paintings east of the Watson P. Davidson WMA. Sites are currently used in the Project Study Area, including in the Sandilands Provincial Forest, for pow wows, sweat lodges and sundances.

One 64-hectare portion of the FPR near Lonesand has moderate to high potential for heritage resources, as it has not been cultivated. It will be further assessed once locations of transmission towers are determined. Some tower locations near waterway crossings may also require further assessment. The project has the potential to affect cultural sites through disturbance during construction, as a result of clearing of the ROW and excavations for tower foundations. Increased access resulting from the ROW and access trails created for the project could result in impacts on cultural and heritage sites through vandalism or alteration of the sites. Sensory disturbance (noise, crowds, burning) resulting from construction and maintenance could affect the experience of people attempting to use cultural sites.

Locating the project largely on disturbed or agricultural land reduces the potential for effects on cultural and heritage sites. Few new access trails will be needed for building the transmission line, since there is already plentiful access along most of the route. The route avoids the specific culturally significant rocks mentioned by some First Nations, the region around Marchand and the area east of the Watson P. Davidson WMA. As a result, many of the cultural sites identified in the FNMEP are outside the area that will be affected by the project.

Manitoba Hydro has developed a draft Cultural and Heritage Resources Protection Plan that describes processes to protect

cultural and heritage resources discovered during construction. The MMF and First Nations will have the opportunity to develop protocols for protection of such resources. Pre-construction investigations will be carried out by a professional archaeologist in areas considered to have high archaeological potential or that are sensitive to First Nations or Metis. Any cultural or heritage sites will be marked for protection, with established buffer zones and fencing.

What We Heard – Traditional Land and Resource Use

Several participants spoke of use of and travel through the project area by Dakota, Anishinabe and Cree people dating back into pre-contact times. One participant referred to a trade route known as “the tobacco path” that ran through the area, which also connected communities near Red Lake, Minnesota, with those around the Red and Assiniboine Rivers. The area also contained routes that connected communities along the Red River with the wild rice and other resources around Lake of the Woods.

Several participants referred to the long-term decline in the amount of forested land in the Project Study Area as a cause of reduction in available land for practising traditional harvesting or cultural activities. Several speakers representing Indigenous participant groups noted that Crown land is the land most readily available for exercise of Aboriginal rights to carry out traditional harvesting and other pursuits. The decline in the amount of forest cover in the study area, from more than 60 per cent in 1930 to just over 44 per cent in 2016, means that hunting, trapping and harvesting of traditional plants are more concentrated now on the remaining land that is still forested. In this context, the amount of forest to be cleared by the MMTP gains greater significance, they said.

One participant group was concerned that Manitoba Hydro sought to assess the effect of the project on traditional land and resource use by using only two measurable parameters: availability of resources and access to land. The participant argued that the corporation should also have assessed behaviour and beliefs of traditional harvesters. The Manitoba Metis Federation’s Traditional Land and Resource Use study included results from interviews with 47 Metis harvesters regarding their preferred resource-harvesting areas. They indicated approximately 3,000 harvesting locations within the RAA, 281 of which intersected the ROW. In the study, the harvesters reported that they prefer to avoid areas where they can see, hear or smell industrial development. Of the harvesters interviewed, 73 per cent said they would avoid a transmission line by at least 100 metres, which, it was argued, means the project will affect a larger area of traditional land and resource use than just the ROW. The participant argued that, because Manitoba Hydro focused on statistics representing the biophysical environment, rather than attitudes and preferences of Metis people, the EIS essentially used the biophysical environment as a “proxy” for Metis interest. As a result, it failed to capture the full impact on Metis harvesters. The participant also expressed the concern that during construction, the ROW will be completely off-limits to hunting and during operations it will on occasion be off limits because of the presence of maintenance and vegetation management workers. It was argued that the loss or degradation of available Crown land for traditional land use is in effect greater because there is relatively little unoccupied Crown land within the RAA: approximately 66,000 hectares, amounting to 10.3 per cent of the total RAA.

Some participants expressed concern about the fact that Manitoba Hydro pays only 25 per cent of the market value of Crown land in order to obtain easements. They contrasted

this with the 150 per cent of the greater market value of farm land that Manitoba Hydro pays for easements in privately owned agricultural areas. This, it was argued, creates an incentive for the corporation to locate transmission lines on Crown land, further reducing the area available for traditional resource use.

Given the reduced amount of land available for traditional resource use and harvesting, some participants recommended that Manitoba Hydro be required to replace any Crown land used by the project, by acquiring private land and turning it over to the government as land that could support wildlife, plants and traditional resource harvesting.

Commission Comment – Traditional Land and Resource Use

While it is true that the project will only affect a fairly small amount of Crown land, as well as private land on which resource harvesting can be carried out with permission, it is important to keep in mind that this effect occurs in an area where intact natural land has steadily been diminished over the past 80-plus years. A series of gradual small reductions in the amount of natural habitat is sometimes referred to as a “nibbling” effect. While the reduction in natural habitat resulting from the MMTP will be relatively small, it will be important to make sure that it isn’t followed by a nibbling effect resulting from increased access to previously intact areas. This issue is discussed further in Chapter Twelve in the discussion of Manitoba Hydro’s Access Management Plans. Because of the long-term loss of land for traditional resource use, it will be important for Manitoba Hydro to involve First Nations and Metis in monitoring of the project and identification of sensitive sites. It is worth pointing out, however, that one

of the reasons Crown land makes up only a little more than 10 per cent of the RAA is that Manitoba Hydro selected a route that runs to the west of much of the Crown land in the region (much of Winnipeg is located within the RAA). As some of the Indigenous participants pointed out, the impact on traditional land use would have been much greater if Manitoba Hydro had selected a route on the east of the Watson P. Davidson WMA.

Manitoba Hydro’s proposed monitoring plan includes inviting First Nations and Metis representatives on regular field trips during the construction period, focusing especially on highly valued undisturbed land or land with minimal disturbance. Carrying out field trips of this nature before construction would allow First Nations and Metis representatives to identify potential conflicts with important plant harvesting, cultural or other sites before any damage can occur.

9.3 Heritage Resources

9.3.1 Overview

Heritage resources are vulnerable to loss or damage as a result of development. The artifacts within heritage resources are vulnerable to destruction, and the understanding and appreciation of the resources can be harmed by other forms of disturbance. Under *The Heritage Resources Act*, if a development may damage heritage resources or human remains, a heritage resources impact assessment (HRIA) may be required to determine the effect of the project. Manitoba Hydro carried out an HRIA in September and October 2014 to assist in routing decisions and to help make informed choices about prevention of damage.

Manitoba Hydro notes that, in the event that any kind of activities result in the discovery of human remains, procedures to

follow are laid out in *The Policy Respecting the Reporting, Exhumation and Reburial of Found Human Remains*. The *Cemeteries Act* includes regulations for the prevention of damage to cemeteries.

In addition to field surveys of known historic and archaeological sites, the HRIA involved gathering information from a number of archival sources and databases and carrying out a desktop analysis of the Project Study Area to indicate those areas most likely to have undiscovered heritage resources. Previously recorded sites within a 200-metres corridor centred on the ROW or within 200 metres of an alternative route were re-examined during the HRIA, except for two sites on private land where the researchers were unable to obtain the permission of the landowner. In areas with high potential for undiscovered heritage resources, shovel tests were carried out and data on soil, topographical features and vegetation were compiled. These locations had been identified through predictive modelling, using desktop tools, to identify places with high potential for undiscovered heritage resources. Locations considered to have high potential included those along ancient beach ridges, those with access to water, those within 500 metres of known heritage sites or historic trails, and those that were under native vegetation. Areas considered to have less potential for undiscovered heritage sites included bogs and marshes, areas of organic soil or peat deposits, and areas that have been disturbed through agriculture, road construction, residential or other development.

Heritage resources located within the project area include archaeological sites, provincially and municipally designated sites, centennial farms, school sites, burials and cemeteries. Potential impacts on heritage resources could result from clearing of the ROW, excavation for tower foundations, the visual impact of the project and soil

compaction as a result of the movement of equipment. Locations of known heritage resources were considered during the route-selection process, in which proximity to heritage resources was one of the factors used to assess the suitability of alternative routes.

9.3.2 Potential Effects on Heritage Resources

A database of heritage resources within the Project Study Area lists 178 sites, including 61 archaeological sites, seven provincially or municipally designated historic sites, 27 school sites, 68 cemeteries and 15 centennial farms. Of the 61 archaeological sites, all but three are disturbed or partially disturbed as a result of agriculture, gravel extraction or erosion.

Five of the previously identified archaeological sites lie within the PDA: one in the proposed new ROW and four in the existing ROW. The site in the new ROW is in a cultivated hayfield where a broken projectile point was discovered on the surface. No further heritage resources were discovered there when it was assessed as part of the HRIA. The four sites in the existing ROW were previously disturbed by agriculture or other development. No municipal or provincial sites or schools are located within the PDA or LAA. One centennial farm has its farm buildings outside the LAA but some of its farm fields within the LAA. One cemetery, Ridgeland Cemetery, near the community of Sundown near the southeastern end of the transmission line, is within the LAA, a short distance from the proposed ROW. Burial sites are sometimes found beyond the fences of cemeteries, in cases where a site was used for burials before a formal cemetery was established. During the HRIA for the project, no evidence was found of burials beyond the recognized cemetery boundary. Two sites dating to the historic period were recorded during the HRIA for

the project. One consisted of the remains of an abandoned farm/homestead, dated to the early 20th century, on the north bank of the Assiniboine River within the existing corridor (in the SLTC). The other consisted of stone foundations of a house near the Canada-U.S. border. Remnants of a possible cart path were recorded within the PDA within the SLTC, but no artifacts were discovered associated with this site. No heritage resources have been detected at the project locations adjacent to the existing Glenboro South, Dorsey and Riel stations.

One 64-hectare area encompassing parts of the PDA and the LAA, west of Lonesand, was assessed to have moderate to high potential for heritage resources as it has not been previously cultivated or developed. It will be considered an environmentally sensitive site and is recommended for further on-site study.

ROW clearing, geotechnical testing, construction of access trails, digging foundations for towers, and establishment of marshalling yards, borrow pits and temporary camps have the potential to affect heritage resources, such as archaeological sites that are currently buried in the soil. Vegetation clearing during the operations and maintenance phase of the project also has the potential to disturb heritage sites.

9.3.3 Mitigation and Prevention of Effects on Heritage Resources

Manitoba Hydro states that the route-selection process prevented most potential effects on heritage resources through avoidance. Prevention of effects on heritage resources that are not currently known will include preconstruction investigation by a professional archaeologist in areas close to known heritage sites or that are considered culturally sensitive as identified through the FNMEP. A Culture and Heritage Resources

Protection Plan, to be developed prior to construction, will specify rules for buffer zones around sensitive sites or known heritage resources, as well as procedures to follow in the event that heritage resources, including human remains, are discovered during construction or other phases of the project.

What We Heard – Heritage Resources

The panel heard concerns from one participant about a centennial farm adjacent to the FPR, which had not been identified as such in the EIS. After receiving an information request about the matter, Manitoba Hydro was able to determine that the farm in question was a centennial farm and had been missed in the assessment by error. There was, however, debate over the significance of the centennial farm designation. It was noted that the transmission line will cross part of the farm's property, but the farm buildings themselves will be outside of the LAA. The centennial farm program is administered by the Manitoba Historical Society. It does not convey added legal protection to a property, but indicates that a farm of at least 50 acres has been owned continuously by direct descendants of the same family for at least 100 years at the time of designation.

The panel heard participants describe historic and pre-contact travel through and use of the Project Study Area by Indigenous people. Traditional travel routes between what is now Winnipeg and Red Lake, Minnesota, passed through the area, as did routes to the Lake of the Woods. In a discussion of historic travel routes, it was explained that many of these early paths, because they followed higher ground to avoid wetlands, became cart trails in the early historic period. Those cart trails, in turn, were often the routes chosen for railroads and roads. It is noted in the EIS that the RAA

contains historic cart paths to Ste. Anne, as well as the historic Dawson Trail. Dawson Road, located within the RAA, follows part of the route of the historic trail.

Commission Comment – Heritage Resources

The panel acknowledges that much of the FPR traverses land that has been modified by agriculture or other development. In these areas potential for heritage resources is low. However, some areas are located in places with greater potential for heritage resources. In these locations, especially, Manitoba Hydro must engage with First Nations and Metis in order to ensure that no heritage resources will be damaged by the project. For portions of the ROW that were not finalized at the time of the HRIA, such as the southern portion that was modified when the border crossing location was changed, it will be necessary to gather input from First Nations and Metis prior to construction. Manitoba Hydro's proposed monitoring plan includes inviting First Nations and Metis representatives on regular field trips during the construction period, focusing especially on highly valued undisturbed land or land with minimal disturbance. Carrying out field trips of this nature before construction would allow First Nations and Metis representatives to identify potential conflicts with heritage resources before any damage can occur.

Licensing Recommendation

The commission recommends that:

- 9.1 Manitoba Hydro include participation of Indigenous and local knowledge holders in heritage resource surveys.

9.4 Infrastructure and Services

9.4.1 Overview

Assessment of the project's potential effect on infrastructure and services included possible effects on air and road transportation, water and wastewater facilities, landfill sites, and utility infrastructure, as well as the effect of the project on demand for accommodations within the RAA, demands on community infrastructure (including fire, police and recreation services) and potential effects on communications. Effects on this VC could be caused by the presence of project workers during construction (such as increases in road traffic) or the physical presence of the project itself (such as the impact of the transmission line on communication signals).

The LAA for this VC is larger than for most others, because infrastructure and services could be affected throughout neighbouring communities where workers travel or live during the project. Accordingly, the LAA for Infrastructure and Services includes all the rural municipalities where the project is located (Rosser, Headingley, Macdonald, Ritchot, Springfield, Taché, Ste. Anne, La Broquerie, Stuartburn, Piney and Glenboro-South Cypress) plus nearby communities that have infrastructure and services that will be used by the project (Winnipeg, Brandon, Steinbach and Ste. Anne).

9.4.2 Potential Project Effects on Infrastructure and Services

The communities within the LAA of the project make up nearly two-thirds of the population of Manitoba. Excluding the cities in the LAA, the transmission line runs through two of the fastest-growing rural municipalities (RMs) in Manitoba (Headingley and La Broquerie). Those portions of the line

from La Broquerie north and west are more heavily populated than the two southernmost rural municipalities (Piney and Stuartburn.)

Because it contains heavily populated urban and suburban areas as well as sparsely populated rural areas, the project area's public infrastructure varies in type and capacity. Water in the LAA is provided by a variety of public drinking water systems, regional water supply systems and private wells, with water sources including Shoal Lake (for Winnipeg), the La Salle River (for the RM of Macdonald), and groundwater for most of the rural municipalities and towns along the FPR. RMs and communities use a variety of wastewater facilities, including treatment plants, lagoons, low-pressure sewage systems and septic tanks. For both drinking water and wastewater, those communities and RMs with public systems recorded capacity capable of meeting the demand of the current population. Such figures were not available for many of the less-populated RMs, where water is provided by private wells and wastewater is dealt with using private septic tanks and septic fields.

Mobile construction camps will require drinking water and generate solid and liquid waste, which will need to be trucked to other facilities. Camps are expected to require 200-250 litres of water per person per day, which will amount to 25,000 litres per day for a 100-person camp, compared to the 1.8 million litres per day available at Steinbach (capacity above what is used on average each day). Construction camps will then require wastewater disposal capacity of 25,000 litres per day, which will be taken to wastewater disposal sites based on capacity. Currently, within the rural municipalities where the project will be built, available wastewater capacity is more than two million litres per day.

Solid waste disposal within the LAA is carried out at the Winnipeg, Ritchot, Steinbach and De Salaberry landfills, which have capacity for 20 to 100 years. The RMs of Ste. Anne and

La Broquerie use the Steinbach landfill and the RM of Headingley uses Winnipeg's Brady Road landfill. Some of the RMs, such as Springfield and Stuartburn, use transfer stations to gather solid waste for disposal elsewhere. Current usage of landfills in the LAA ranges from 400,000 tonnes/year at Brady Road to 37,775 tonnes/year at Steinbach. Construction will generate steel, aluminum, copper and ceramic waste. The project is expected to generate more than 10,000 tonnes of steel and aluminum waste and 149 tonnes of copper waste, which will require recycling. Work camps are predicted to generate 15-20 cubic metres of general waste, packaging and cardboard per week.

Firefighting services in the LAA are provided by a combination of professional and volunteer firefighters, while policing is carried out by the RCMP in most of the LAA and by municipal police in Winnipeg, Steinbach and Ste. Anne. Outside of the cities, the fire departments in the rural municipalities typically have 25-35 members (the more heavily populated RM of Springfield being an outlier with 60 members). Many of the fire departments in the RMs deal with 100-200 fire calls per year, with Springfield again as an outlier at 500. The most common concern regarding fire safety is that construction of the transmission line could cause road closures or road work that slows emergency response time. Generally speaking, the RCMP detachments serving the RMs along the FPR have higher caseloads per officer than do the city police departments. However, crime statistics (violations per 100,000 population) are lower in the rural municipalities and communities along the FPR. The project may increase demand for police and fire services because of the influx of workers in the LAA and the presence of workers commuting from Winnipeg and Brandon to work sites.

Manitoba Hydro estimated the availability of temporary accommodation in the LAA to include approximately 6,500 hotel rooms in

Winnipeg, 1,400 in Brandon, 100 in Steinbach and 80 in Headingley. There is essentially no hotel accommodation south of Steinbach for use in the project. At the peak of construction the maximum number of workers on all components of the project will be 175. Ample temporary accommodation is available in Winnipeg and Brandon for workers near those locations (those working on the Dorsey, Riel, existing corridor and Glenboro South portions of the project). Manitoba Hydro will use temporary work camps where there are few accommodations available. The use of temporary camps and commuting from Winnipeg or Brandon will mitigate any impact on temporary accommodations in other parts of the project area.

The transmission line will cross or run parallel to a large number of roads, highways, railways, electrical transmission lines, pipelines and other infrastructure. It will have 12 crossings of other transmission lines, although no crossings of the M602F 500 kV AC line, 10 crossings of railways and 21 road and highway crossings (including five crossings of major highways). The project will cross the Enbridge pipeline twice, the TransCanada pipeline three times (paralleling the latter for three kilometres at a distance of 100 metres) and the Winnipeg aqueduct twice. The project also runs alongside the Red River Floodway for 17.7 km at a distance of 150 metres. It will cross the Red River just upstream of the floodway gate, and this crossing was identified for further study by Manitoba Infrastructure and Transportation during the provincial review process. It will pass within two kilometres of the Lyncrest airport on the eastern edge of Winnipeg near the Perimeter Highway and will pass four kilometres from the Piney-Pinecreek Border airport and 5.1 kilometres from the Zhoda airport. Other public infrastructure within one kilometre of the transmission line is the Oak Bluff Wastewater Treatment Lagoon (290 metres) and the La Broquerie Wastewater

Lagoon (900 metres). Winnipeg's Brady Road landfill will be 2.4 km from the line.

The EIS contains an assessment of current traffic volume in the area, as well as the potential effect of traffic related to construction of the project. Highways in the LAA that could be affected by construction and maintenance traffic include the heavily travelled PTH 1, PTH 15 and PTH 12, as well as the lightly travelled portions of PTH 12 at the southern end of the LAA. The greatest density of traffic is on the two-lane PTH 15, running from Winnipeg through Dugald and Anola, a two-lane highway with traffic volume of more than 10,000 vehicles per day. The Trans Canada Highway, PTH 1, carries traffic volumes of more than 18,000 vehicles per day west of Winnipeg at Headingley and more than 11,000 vehicles per day east of Winnipeg. The four-lane portion of PTH 12, running from Steinbach north to PTH 1, carries more than 5,000 vehicles per day. This portion of PTH 12 has the highest rate of accidents of any of the highways in the region, as it passes through a section with urban intersections. Some less busy stretches of PTH 12 have relatively high rates of accidents as a result of collisions with wildlife.

The project will result in some increases of traffic as a result of goods and equipment being hauled to work sites, waste being hauled for disposal and commuting by workers. This may result in some additional congestion on roads and highways. Manitoba Hydro estimates that PTH 1, PTH 12 north of Steinbach and PTH 12 south of Steinbach will have an additional 175 vehicles per day as a result of project construction. This will be an increase of 19.6 per cent for the lightly travelled southern portion of PTH 12, but 2.8 and 1.4 per cent respectively for the northern portion of PTH 12 and for PTH 1. To reduce the impact on traffic, Manitoba Hydro will use buses and vans to transport workers from camps to work sites. Manitoba Hydro will

also work with local authorities to repair any damage to roads that occurs as a result of the project. The project will also cause temporary disruptions to traffic, particularly when the conductors are being strung at the various road and highway crossings.

When operating, the project will cause induced currents in vehicles traveling within the ROW. Modeling carried out by Manitoba Hydro predicted that these currents will be below the CSA guidelines except in locations within the RVTC, where for farm vehicles the induced current will be slightly above the guideline. These sections of the ROW are on land owned by Manitoba Hydro. Induced currents are caused by the magnetic field surrounding the conductor wires. This induces a current in nearby materials that conduct electricity, such as vehicles. Because farm vehicles are taller than cars, and therefore closer to the conductor wires, induced currents will be slightly stronger in farm vehicles than in cars. Within the RVTC, Manitoba Hydro will communicate about safety issues with farmers who use the ROW. Manitoba Hydro expects the distance of the line from railways and pipelines will prevent induction effects on them. These effects will need to be monitored to ensure that the induced currents do not impair the operation of railway signaling devices, damage pipelines or cause the potential for shocks. Existing CAN/CSA standards specify clearances of transmission lines from road, pipeline and railway crossings in order to keep induced currents within safe levels.

The project will have some effect on radio communications when operating, especially during rainy weather, when water droplets in the air increase the effect. At road and highway crossings, the transmission line could cause some radio noise interference that will affect AM radio, but only in close proximity to the line. Interference with radio drops off sharply with distance from the line. Some residences less than 100 metres from the line may also be affected in foul weather.

9.5 Employment and the Economy

9.5.1 Overview

The project will result in a short-term effect on employment as some \$35 million is spent on labour in Manitoba and an additional \$18.4 million is spent on labour elsewhere in Canada. Construction of the project is expected to require 124 person-years of employment, all within Manitoba, and 241 person-years of employment for the suppliers of components and materials, divided approximately equally between Manitoba and other places in Canada. Multiplier effects create additional employment as a result of household spending on goods and services. The total cost of the project was estimated at \$453 million as of the time of the hearings.

Within the rural municipalities crossed by the project, the labour force increased by 5.5 per cent from 2006 to 2011 (42,910 in 2011). Unemployment rates varied at the time of the study from a low of 2.5 per cent in Ste. Anne to a high of 7.7 per cent in Glenboro. The LAA has a labour pool of approximately 5,850 individuals in the trades, transport and equipment operator fields. Based on the unemployment rate as of 2015, the available pool of workers in these fields within the LAA was 258 individuals. The Indigenous labour pool in these fields amounted to 675 individuals at that time, 37 of whom were available. Although data were not available for all rural municipalities, Indigenous labour force participation in the LAA is higher than the average Indigenous participation rate for Manitoba and the Indigenous unemployment rate in the LAA appears to be lower than the provincial average Indigenous unemployment rate.

Effects on employment and the economy caused by the maintenance and operation phase of the project will be minor, as relatively few workers will be required to inspect and maintain the line.

Manitoba Hydro will contact local municipal authorities, First Nations and the MMF prior to the beginning of the project in order to facilitate economic opportunities in the LAA. Manitoba Hydro will also work with contractors during the contracting process to promote the participation of Manitoba companies.

What We Heard – Employment and Economy

The panel heard representatives of Indigenous participant groups who said their communities wish to be able to participate through employment in projects such as the MMTP. One participant cited examples from British Columbia and Ontario of programs to assist First Nations and Metis communities to participate in energy projects, develop clean energy projects and in other ways to benefit from such developments. Policies also include contract set-asides or “price adders” for energy projects led by or partnered with Indigenous companies. Manitoba Hydro required at least 15 per cent Indigenous content (employees or subcontractors) in contracts for work on Bipole III and has increased that minimum to 20 per cent for the MMTP. Manitoba Hydro was specifically asked by one participant about a heavy equipment operator training program for Indigenous workers it ran prior to the Bipole III project. The corporation stated that, because the MMTP is significantly smaller than Bipole III and requires fewer heavy equipment operators, it is not contemplating a similar program. Instead, Manitoba Hydro will encourage contractors to provide on-the-job training for Indigenous workers. In response to another participant’s questions, Manitoba Hydro also described a scoring system used to encourage contractors to hire Indigenous

workers or subcontract to Indigenous companies. The system works to effectively make a company’s bid more competitive if it achieves a greater percentage of Indigenous participation than the minimum requirement.

Several presenters in La Broquerie expressed concern that the MMTP would harm the economy of the area by preventing growth. Presenters said that the proximity of the ROW to the town of La Broquerie would limit the community’s ability to expand and attract new residents. Those concerned about potential impacts on agriculture, particularly dairy farms and livestock operations, said the line could harm the local economy by restricting growth of the most important industry in the area.

Commission Comment – Employment and Economy

The commission is aware that on projects in northern Manitoba, Manitoba Hydro has agreements in place to encourage the hiring of local and Indigenous employees, as well as to encourage contracting with Indigenous-owned businesses. Major northern projects have also involved substantial investments in training to enable Indigenous residents to find employment on these projects. While not on a comparable scale to the Bipole III or Keeyask projects, the MMTP will still generate a substantial amount of employment and income. Manitoba Hydro should take steps to ensure that local and Indigenous workers have the opportunity to work on the project, and to ensure that training and employment programs provide a respectful workplace and experience that can lead to future opportunities in the corporation.

Non-Licensing Recommendation

The commission recommends that:

- 9.2 Manitoba Hydro, over the course of the MMTP, continue to improve its processes to provide greater opportunity for Indigenous employment and skills development and a respectful workplace.

9.6 Agriculture

9.6.1 Overview

Construction and operation of the project have the potential to reduce the amount of land available for agriculture, degrade the quality of agricultural land and interfere with agricultural activities. The ROW for the project includes approximately 1,968 hectares of land used for agriculture (average for 2009-2014), which will be temporarily unavailable for use during construction and which may be affected after construction by soil compaction, weeds, the physical presence of the towers and other project impacts. Agricultural land accounts for approximately 62 per cent of the Project Development Area (PDA), including land in the ROW and the footprint of the expansions at the Dorsey and Glenboro stations. Generally, the existing corridor portions of the project (the SLTC and the RVTC) are on land of higher value, in which a greater percentage of the agricultural land is used for row crops, cereals and oilseeds. Within the existing corridor, 374 hectares were used for row-crop production and 851 hectares for cereal/oilseed production. By comparison, the proposed new ROW had 38 hectares of row-crop production and 77 hectares used for cereals and oilseeds. The existing-corridor portions of the ROW generally have a higher capability for agriculture. Within the existing corridor, 10 hectares are classified as class 1,

563 hectares are class 2 and 906 hectares are class 3. Within the new ROW, by comparison, there was no class 1 land, 12 hectares of class 2 and 171 hectares of class 3.

The EIS notes that agriculture directly accounts for 3.6 per cent of Manitoba's gross domestic product. Together, primary production of crops and livestock and other food-processing businesses account for more than 25 per cent of Manitoba's total provincial exports. Agriculture was selected as a VC for assessment because of its importance to Manitoba's economy and communities within the RAA. The LAA for agriculture extended one kilometre in each direction from the FPR and the other components. The RAA included the entirety of the 10 regional municipalities traversed by the line, plus the RM of South Cypress, where the Glenboro South Station is located.

9.6.2 Potential Effects on Agriculture: Loss of or Damage to Agricultural Land

The project will cause temporary loss of access to land along the ROW during the construction period and a smaller amount of permanently lost land at the base of each tower in the transmission line. Manitoba Hydro expects the temporary loss of land to affect one growing season in the SLTC and two seasons in the remainder of the ROW (the RVTC and the new portion). In some cases, construction in the ROW will prevent access to other portions of fields.

Each tower will cause a permanent loss of agricultural land at the foundation, plus an area immediately surrounding the tower where it will be impossible for equipment to safely or efficiently manoeuvre. Manitoba Hydro calculates the area of 100 per cent crop loss for a tower with a 10-metre-by-10-

metre base as approximately 0.1 acre. Angle towers have a base of 15-by-15 metres in order to support the greater force exerted at a bend in the transmission line, so they have a larger footprint. A larger area surrounding each tower is still available for farming, but because of the difficulty of manoeuvring farm equipment, this land is calculated to lose 20 per cent of its crop-growing capacity. For a standard, 10-by-10-metre tower, this area is just over 0.5 acre. Manitoba Hydro expects to use approximately 415 self-supporting towers, with a total footprint, including a three-metre buffer, of 11.7 hectares in agricultural Manitoba.

The project has the potential to cause damage to agricultural land through compaction and rutting caused by heavy equipment and in some cases through erosion. Compaction is a greater risk on soils that are fine-textured and poorly drained, particularly if construction is carried out when the ground is wet. Erosion is a possibility if soils that are stripped during the construction of towers are not adequately protected from wind and water. Occasional travel along the ROW during the operation phase of the project – during inspections or maintenance – has some potential to damage soils. Areas within the PDA that have a high risk of compaction total 2,070 hectares, roughly two thirds of the PDA.

Manitoba Hydro presented a 2015 study that estimated the value of lost agricultural productivity on a transmission ROW. Based on nine-by-nine-metre towers with a one-metre buffer (smaller than for the MMTP) and a tower interval of 400 metres, the loss of productivity was estimated at \$16.06 per acre (approximately \$40 per hectare) per year for a wheat crop.

Timing of construction in winter and avoidance of wet conditions are intended to reduce damage to soil productivity. Landowners will be compensated for

temporary loss of access to land during construction and the permanent loss of land adjacent to towers.

9.6.3 Potential Effects on Agriculture: Interference with Agricultural Operations

The presence of the towers presents an obstacle that interferes with movement of farm machinery and the aerial application of pesticides. The presence of the transmission line and towers could limit future agricultural activities or agricultural infrastructure. Six farm buildings are located within the PDA of the existing corridor and will need to be moved. There are no farm buildings within the PDA of the new ROW. Movement of heavy equipment and digging of foundations for the transmission line towers could interfere with tile drainage in fields and also affect watering systems for livestock. Within the LAA for the new ROW, four livestock operations use groundwater, and if their watering stations or pipes are located within the new ROW they may need to be moved.

The towers present a greater obstacle to movement of farm machinery when they are placed on a diagonal line across a field. Within the existing corridor portions of the ROW, nine kilometres run diagonally. Within the new ROW, 26.3 km run diagonally, although much of this is on grazing land.

Placement of towers also interferes with the spreading of liquid manure, which is carried out using farm machinery connected by hose to manure storage tanks. The presence of the towers may limit where the hoses can reach and make it difficult to spread manure in portions of some fields. Diagonal tower placements are likely to cause a greater difficulty than straight-line placements. This is particularly a concern for hog operations, of

which there are two located within the LAA along the existing corridor and 10 in the LAA of the new ROW. Dairy farms also spread manure. One dairy farm is located in the LAA of the existing corridor and there are four in the LAA of the new ROW. Including beef, mixed and unclassified operations, the LAA for the entire project contains 55 livestock operations.

Aerial application of pesticides is an important practice in many parts of the project area, especially in the intensively cropped areas of the RMs of Macdonald, Ritchot, Taché and Springfield. In wet conditions, it may be impossible or difficult to spray crops on imperfectly drained land or land with fine-textured soils. Farmers who are unable to spray using land-based applicators often use aerial application. The presence of the transmission line in farm fields limits access for aerial spraying, especially when the line runs diagonally. Because much of the agricultural land in the new ROW is used for grazing, the impact on aerial application is likely to be greater in the SLTC and RVTC portions of the ROW.

Concerns have been expressed about the potential for interference by the transmission line with the reception of global positioning system (GPS) signals used in some agricultural machinery. Farmers use GPS for auto-steer functions, to apply precise amounts of fertilizer or other inputs on specific parts of their fields and for other purposes. As a result, precision agriculture requires continuous reception of GPS signals and concern exists that electromagnetic interference from the transmission line could interfere with these signals. However, Manitoba Hydro states that the type of GPS used in farming requires error-correcting signals from receivers on the ground, in addition to the satellite signals used by GPS. These ground signals, coming from antennas only a few metres above the ground, would be unlikely to be affected by the

transmission line. Manitoba Hydro stated that research has shown no effect on the navigation systems using GPS receivers of the type used in farming tested under Manitoba Hydro DC and AC transmission lines. The frequency of the signals coming from satellites and the ground-based antennas (1200 to 1600 GHz for the former and 450 MHz for the latter) is much higher than the frequency of electromagnetic interference from transmission lines (less than 1 MHz).

Concerns have also been expressed that transmission lines may have an impact on livestock operations through electromagnetic frequencies, stray or “tingle” voltage and the corona noise that can sometimes be heard near the lines. Two dairy operations near La Broquerie are about 70 and 220 metres away from the new ROW. Manitoba Hydro has stated that, if required, it will conduct investigations using controlled standard test procedures to determine if electrical transmission is contributing to any observed stray voltage. The corporation states that stray voltage does not originate from transmission lines. It is typically a result of an unbalanced load within the wiring of the farm or grounding issues with electrical equipment on the farm. When the wiring is unbalanced, electrical current travels through the ground to balance itself. By placing its mouth in a watering trough, a cow can complete an electrical circuit and get a shock.

Manitoba Hydro cited research on the effect on agriculture of EMF and audible noise, stating that studies have not demonstrated any adverse effect on farm animals, wildlife or crops as a result of EMF or audible noise from transmission lines.

Biosecurity is another concern in agricultural areas crossed by the transmission line. Transportation of soil from one area to another is an important mechanism for the spread of weeds and soil-borne diseases.

Movement of equipment and workers during construction and maintenance has the potential to spread weeds, pathogens and pests. Procedures to reduce soil transport and prevent the spread of weeds and soil-borne diseases include scheduling work when ground conditions are favourable (after harvest and freeze-up), pressure washing equipment to remove soil, cleaning and disinfecting safety footwear, and keeping biosecurity checklists that record vehicle and equipment cleaning and inspection. To prevent the spread of animal diseases, Manitoba Hydro plans to avoid access during construction through areas that contain manure and to ask landowners or producers to avoid spreading manure prior to construction. Manitoba Hydro's biosecurity standard operating procedures also include conducting a risk assessment to identify potential risks to agricultural lands.

While some effects can be avoided through route selection or reduced through line placement (avoiding diagonal crossings) and other effects can be reduced through the Environmental Protection Program (avoiding work in wet conditions, using construction mats to prevent soil compaction), some impacts will remain. Manitoba Hydro's mitigation approach for agriculture includes landowner compensation for loss of land, loss of productivity and interference with farm operations. On land it does not already own or for which it does not already have an easement, Manitoba Hydro will pay for easements giving it the right to use land for a transmission line ROW. For such easements, Manitoba Hydro pays 150 per cent of the assessed value of the land. Construction damage compensation is paid to landowners who experience any damage to their property. It will be provided to pay landowners for the rejuvenation of top soil, should that be necessary, or damage to any farm structures or irrigation or drainage infrastructure. Structure Impact Compensation is a one-time payment for each transmission tower placed on land

classed as agricultural and is intended to compensate for the direct loss of land, plus the area of reduced productivity immediately around a structure, the additional time required to manoeuvre around structures and the double application of seed, fertilizer and herbicide in areas immediately around each structure.

What We Heard – Agriculture

The panel heard from one presenter who was concerned about the possibility of “tingle voltage” affecting his cattle. He said several other dairy farmers in the area around La Broquerie are located close to the transmission line FPR. Tingle voltage affects the behaviour and the milk production of dairy cattle by giving them a shock when they contact the milking equipment on a dairy farm, the presenter said. In response to questions about tingle voltage, Manitoba Hydro stated that the phenomenon is not caused by transmission lines. Typically, it is a result of inadequate grounding of the electrical equipment on the farm itself and the electricity that provides the shock does not come from transmission lines but from the supply line leading into the farm.

Concerns about application of manure, via drag hose, and the challenge of manoeuvring past the transmission line towers were also mentioned by some presenters.

The panel heard that the changing nature of agriculture in Manitoba makes Manitoba Hydro's compensation inadequate. One farmer who spoke at the hearings noted that in the last 20 years, many Manitoba farmers have switched from lower-value crops, such as barley, to higher-value crops, such as corn. If future changes in cropping increase the value of crops that can be grown on a piece of land, then the compensation offered today (150 per cent of the value of the land used by the ROW) may not make up for the farmer's lost future income.

The panel also heard concerns about biosecurity and the potential for the project to spread diseases or other pests. In portions of the proposed new ROW near La Broquerie, the line will travel through areas with a large number of livestock operations. Many of these operations spread manure on their land, and one presenter said manure can be a medium for spreading disease such as porcine epidemic diarrhea (PED). Presenters expressed the concern that construction or maintenance crews travelling from one property to another could spread disease if infected manure from one operation had been spread on the land.

The panel also heard concerns about soil erosion. Much of the agricultural land in the project area is at high risk for erosion. The removal of shelterbelts, it was said, could harm efforts that farmers have been making for years to protect topsoil from wind erosion.

In response to a question on this topic, Manitoba Hydro stated that if landowners request, it will replant shelter belts outside of the cleared area of the ROW to replace those that have been removed.

Commission Comment – Agriculture

The panel is aware that farmers have concerns about changes to their land, even with the compensation offered by Manitoba Hydro. The fact that much of the agricultural land in the new ROW portion of the MMTP travels through pasture or hay land, rather than through grain, oilseeds and other higher-value crop land, may reduce the level of conflict between the project and agriculture.

Some of the concerns, such as those regarding EMFs and tingle voltage, appear to run counter to the prevailing scientific consensus on these matters. Although

Manitoba Hydro has stated that tingle voltage does not come from transmission and distribution lines, it will still be necessary for the corporation to be responsive to any concerns, especially from nearby dairy farmers.

Concerns by farmers regarding biosecurity are understandable. Manitoba Hydro's description of its biosecurity protocols – a system of inspections and cleaning and avoidance of times when manure is present on fields – provides some assurance. Proper monitoring will be required to ensure that all contractors rigorously follow the protocol. Manitoba Hydro will need to be responsive to landowners and provide them with the opportunity to witness these biosecurity protocols in action. Responding to some of the biosecurity concerns mentioned during hearings is more a matter of farm management. To prevent porcine epidemic diarrhea, farmers need to manage barn access and feed inputs, which are not areas associated with any MMTP activities.

Some of the other agricultural issues the panel heard concerned the possibility that the existence of the ROW on farm land may lead to increases in trespassing and resulting damage. This is a concern that will be discussed in Chapter Twelve in the section that addresses Manitoba Hydro's Access Management Plan.

The panel heard concerns both from farmers and residential property owners about the loss of shelterbelts that will be removed within the ROW. In order to protect fields from increased erosion, and to provide the other benefits of shelterbelts, it is important that Manitoba Hydro replace shelterbelts outside of the ROW when landowners wish.

Licensing Recommendation

The commission recommends that:

- 9.3 Manitoba Hydro offer to landowners to plant shrubs or trees in order to replace shelterbelts removed by the project.

9.7 Land and Resource Use

9.7.1 Overview

The transmission line will intersect a number of rural residential developments and areas of commercial and recreational land use. This section of the report examines potential impacts on all land uses other than traditional land use, discussed in Section 9.2, and agriculture, discussed in Section 9.6. In the EIS, Manitoba Hydro discusses potential effects on property and residences, designated lands and protected areas, recreation and tourism, mining, forestry, hunting and trapping (other than First Nations and Metis resource use) and groundwater and surface water. For these factors, the LAA includes a one-kilometre buffer on either side of the transmission line and surrounding the project components. The RAA encompasses the RMs in which the project is located.

9.7.2 Property and Residences

The MMTP will cross or run alongside properties owned by 163 landowners, mostly within the sections of the line requiring a new ROW. Within the existing corridors (the SLTC and RVTC), the ROW affects 31 properties owned by 17 landowners. Land within the two existing corridors includes privately owned land on which Manitoba Hydro already has an easement, Crown land along the Red River Floodway, land owned by the City of Winnipeg and land owned by Manitoba Hydro. The proposed new ROW affects 217 properties, owned by 146 landowners.

Portions of the transmission line go through areas with growing amounts of rural residential development. Communities including Headingley, Oak Bluff, La Salle, Grande Pointe, Ste. Anne, La Broquerie and Marchand are located in the RAA, in some cases close to the LAA. The east side of La Broquerie is within the LAA. Two of the RMs (La Broquerie and Headingley) experienced large increases in population between 2006 and 2011 (42.1 per cent and 17.9 per cent respectively) and had correspondingly large increases in the total number of homes during this period. Other RMs, such as Springfield and Taché, also experienced substantial increases in both population and number of homes. In addition to these private homes, three Hutterite colonies are located near the project: Sturgeon Creek Colony, near Dorsey; Ridgeland Colony, in the RM of Springfield; and Pineland Colony, in the RM of Piney. In total, 1,701 residences are located within one kilometre of the project: 1,174 in the LAA of the existing corridor and 527 in the LAA of the new ROW. One residence is located within the new ROW, and Manitoba Hydro has reached an agreement with the property owner to buy the property. Other properties near the ROW include:

- 40 residences within 100 metres,
- 216 residences that are 100-400 metres from the ROW,
- 626 residences 400-800 metres from the ROW, and
- 818 residences 800-1,000 metres from the ROW.

Within the LAA (one kilometre on each side of the ROW) for the project there are 42 proposed private subdivision applications, consisting of 36 individual parcels of land. Manitoba Hydro, using zoning and development plans to rank the development

potential of land, states that 20 lots or parcels within the LAA are on land with low potential for development and eight lots or parcels are on land with high development potential.

Manitoba Hydro cites a number of studies that have been carried out in Canada and elsewhere that examined the effect of transmission lines on property values. Some studies show a small, negative effect on property values that diminishes over time and with distance from the line. Studies show that effects are greater for higher-priced homes. In addition to distance from the transmission line, the visibility of the line from the property is also a factor influencing the magnitude of the effect on property value. Some studies have found no evidence of an effect or that the statistical significance of the effect can be low.

Since 2000, Manitoba Hydro has conducted an annual review of property values in the Birds Hill and Lister Rapids areas in the RMs of East and West St. Paul in response to concerns of property owners regarding the construction of the Dorsey-St Vital 230kV line. Sales of single-family homes in the area since 1992 have been tracked and in the most recent report, in 2014, housing prices adjacent to and near the line have fluctuated in the same range as others within the area. Manitoba Hydro also commissioned a review of existing literature on the effect of transmission lines on property and the results were mixed. Evidence for a negative effect on assessed value suggests that it is small and diminishes rapidly with distance from the line. While assessed value may have a small negative effect, no such negative effect was seen in sales prices.

9.7.3 Designated Lands and Protected Areas

Through the route-selection process, Manitoba Hydro sought to avoid designated lands and protected areas. However, the

transmission line runs adjacent to and crosses the recently designated Duff Roblin Provincial Heritage Park at the Red River Floodway inlet. This crossing is on land where Manitoba Hydro already has an easement. It also runs adjacent to a parcel of land that is part of Beaudry Provincial Park, north of the Assiniboine River, and borders the existing SLTC.

The transmission line ROW crosses 15 proposed protected areas. Two of these are in the SLTC: at the crossing of the Assiniboine River (the proposed Assiniboine River Clam Beds ecological reserve) and along the Red River Floodway. The remaining proposed protected areas are along the new ROW portion of the line in the RMs of Ste. Anne, La Broquerie, Stuartburn and Piney. Approximately 84 hectares of these proposed protected areas are affected by the ROW. The transmission line does not cross any existing ecological reserves or wildlife management areas, although it passes relatively close to two WMAs. One corner of the Watson P. Davidson WMA, the oldest in Manitoba, is immediately adjacent to the ROW and the Spur Woods WMA is 690 metres north of the line.

9.7.4 Recreation and Tourism

The ROW passes adjacent to or near three golf courses: Southwood, adjacent to the La Salle River near St. Norbert; Cottonwood, in the RM of Ste. Anne near the Trans Canada Highway; and La Verendrye, in La Broquerie. Potential exists for the proximity of the ROW to allow unauthorized access to the golf course property. The ROW crosses two recreational trails: the Duff Roblin Parkway Trail, which is under development starting at the new Duff Roblin Heritage Park, and the Trans Canada Trail, which crosses the Red River on the Courchaine Bridge at the Red River Floodway gate. The ROW crosses several designated snowmobile trails and active all-terrain vehicle (ATV) trails. Concerns were not raised in

the Public Engagement Process regarding the effect of the ROW on these trails and, in fact, snowmobile and ATV groups have expressed interest in using the ROW for recreation. (Concerns about the effect of increased snowmobile and ATV access on the natural and socio-economic environment are discussed in Chapter Twelve in the section on the Access Management Plan.) The ROW does not traverse any campgrounds or resort or cottage areas. The Waverley West baseball complex is located south of the SLTC in St. Norbert and will be close to the ROW for the project.

Impacts on recreational use are largely limited to the visual impact of the line. Visual impact is discussed separately in Section 9.8.

9.7.5 Mining

The project has the potential to affect mining by limiting access to quarries, gravel sources and other resources. Within the ROW of the existing corridor are one quarry withdrawal and four private quarry permits (three of which are concluded), encompassing 38 hectares. Within the proposed new ROW are three quarry withdrawals and seven private quarry permits (three of which are concluded), encompassing 24 hectares. The ROW also crosses municipal aggregate resource areas (five in the RM of Taché, two in the RM of La Broquerie and one in the RM of Stuartburn). In the RM of Taché, discussions with the rural municipality led to changes in the FPR to avoid sand and gravel deposits of importance.

9.7.6 Forestry

Commercial timber harvesting in southeast Manitoba occurs mostly in Sandilands and Agassiz Provincial Forests to the east of the LAA. Except for a few areas north and east of Sundown and at the Piney border crossing, the ROW lies outside of

designated Provincial Forest areas. The LAA occurs within Forest Management Units 1 and 24 of the Aspen Parkland and Pineland Forest Sections. Construction will result in clearing of 219 hectares of commercial forest in this area, reducing the amount of commercial forest available in FMU 1 and 24 by 0.04 per cent and 0.03 per cent, respectively. Manitoba Hydro estimates that this will result in a reduction of the total annual allowable cut for these FMUs of 0.07 per cent the next time AAC is recalculated. Two Manitoba Sustainable Development high-value forest sites, where silvicultural treatments are carried out to control growth, health and quality of forests, occur within the LAA. Construction will not affect these sites. The Manitoba Forestry Association has developed 302 woodlot plans on private land within the RAA, covering approximately 19,400 hectares, and Manitoba Sustainable Development has established 40 Trees for Tomorrow plantations on private land within the RAA. Of these, five woodlot plans will be reduced by a total of 28.6 hectares as a result of clearing of the ROW. Project clearing will also affect 18.4 hectares of land in 79 private shelterbelts.

To minimize disruption to forests, Manitoba Hydro will use existing access roads and trails as much as possible, ensure that all elm wood is burned, chipped or disposed of appropriately to prevent spread of disease, compensate for lost shelterbelts, and re-establish shelterbelts outside the ROW where possible. The corporation will also identify tree improvement sites, shelterbelts and private woodlots in the Construction Environmental Protection Plan to limit damage from construction equipment. For forests on Crown land that are cleared as a result of the project, Manitoba Hydro will pay approximately \$69,000 under Manitoba Sustainable Development's Forest Damage Appraisal and Valuation assessment.

9.7.7 Hunting and Trapping

The project has the potential to affect the success and experience of hunting. Changes in populations of game species could affect success rates and a change in the appearance of hunting areas could affect the experience, particularly for outfitters' clients seeking a "wilderness" hunting environment. Effects on trapping could be caused by changes in population of species trapped or damage to traps caused by increased access to the area.

Concerns expressed about hunting included that disruption of bear dens could affect populations and that the project could open up the area to more hunters, who might use the ROW to access hunting areas and deplete game populations. The presence of the ROW, towers and transmission line, in addition to increased human presence on the ROW, might detract from the hunting experience, especially for clients of hunting outfitters in the area.

Project construction is expected to span eight hunting seasons and four trapping seasons over four years. Game hunting areas crossed by the FPR include GHAs 25B, 33, 34A, 35A and 35. It also crosses game bird hunting zone 4. One commercial outfitter has a lodge two kilometres from the ROW near Sundown and has multi-year bait stations for bear hunting located within 500 metres of the ROW – one is 125 metres from the ROW. These could be disrupted by construction activities.

The ROW crosses Open Trapping Area Zones 1, 3 and 4. In response to concerns about the effects of the project on trapping, Manitoba Hydro cited the Wuskwatim Trappers' Monitoring Program, conducted in 2011 to compare trapper success in sites close to the Wuskwatim transmission line with sites in undisturbed areas. This study found that more furbearers were caught close

to the line than farther from it, in contrast to other literature that suggests furbearers avoid disturbed areas.

Effects on hunting and trapping are expected to be felt primarily during construction, when noise and other disturbances might affect movements of animals. During the operational phase of the project, the cleared ROW may be used by bears, deer and other species that are hunted.

9.7.8 Groundwater and Surface Water

Installation of tower foundations, which can be as deep as nine metres, and geotechnical drilling could disturb groundwater through unintended discharge of aquifers. This has the potential to affect aquifer levels for groundwater users. During operation and maintenance, Manitoba Hydro will use herbicides for vegetation management, which carries the potential for groundwater quality to be affected if the chemicals leach into the aquifer.

To prevent impacts on groundwater, Manitoba Hydro will use a qualified drilling contractor for work in areas with artesian aquifers, monitor groundwater levels in drill holes, seal drill holes as soon as possible, take precautions to prevent mixing of surface and ground water, have an emergency response plan for sealing/grouting drill holes, conduct follow-up inspections to monitor for water leakage and ensure that all provincial regulations are followed regarding herbicide use.

Preventing accidental disturbance of groundwater is discussed in Chapter 10: Accidents and Malfunctions. Use of herbicides in vegetation management is discussed in Chapter 12: Environmental Protection and Monitoring.

What We Heard – Land and Resource Use

Several presenters at La Broquerie spoke about the impact of the transmission line on their properties. Several spoke of their homes as being their “little piece of paradise” and said the line would be within clear sight. Some were also concerned about the project’s impact on property values. One presenter said he had counted 168 houses within one km of the FPR within the RM of Taché alone. Presenters at La Broquerie said locating the FPR near the community had the potential to harm economic growth in the area by discouraging residential development.

Landowners near the FPR raised concerns about the potential for the ROW to increase access to private land. The panel saw photos indicating that access gates are not necessarily maintained and access restrictions appear not to be enforced on existing lines. That raised the question of how effective attempts to control access will be. Private landowners expressed the concern that clearing the ROW through the forested portion of their property will allow trespassers to access their land. It was observed by one presenter that transmission line ROWs are often used as snowmobile trails, leading to the possibility that snowmobilers and other recreational users will assume all ROW land is available for travel.

Presenters at the hearings also mentioned the aquifer areas to the east of the FPR, including those that supply a water bottling company near Marchand. Avoiding impacts on this aquifer was a reason for not routing the MMTP through the eastern portion of the Route Planning Area, they said.

Commission Comment – Land and Resource Use

The panel understands that transmission lines and residential property development will always be somewhat in conflict. On the subject of the effect of transmission lines on property values, the perspectives of land owners involved in the hearings and of Manitoba Hydro differ. It seems clear, however, that what effect there is diminishes with distance from the line and with time. Even if Manitoba Hydro’s research is correct and the presence of transmission lines has only a very small and localized impact on property value, it is clear that many people would prefer not to have one nearby. However, modern life also requires electricity. Many residents have been attracted to rural municipalities in the project area because of a preference for pastoral or natural-looking landscapes. Even without the development of the MMTP, it stands to reason that in the years to come this landscape will be changed by rural residential development. The panel considers that Manitoba Hydro made efforts to avoid many impacts on property and residences through its route planning process. It is likely that more can be done to prevent the visual impacts of the development of the MMTP, and this will be discussed in section 9.8 Visual Impact.

A more fundamental issue that will need to be dealt with in the future is the sustainability of rapid growth in rural residential development. How much more such development can there be before the very character that has drawn people in the first place has been completely altered? And how much more can forest and other lands be converted to residential development before the cumulative effects on wildlife, vegetation and other valued components of the natural habitat become greater than the region can withstand? Such questions will bring large-area planning to the fore, not just to consider effects

of industrial developments such as the MMTP but those of residential development and the transportation and other infrastructure needed to accommodate a larger population. This topic is further discussed in Chapter Thirteen: Going Forward.

The potential for the ROW to affect land and property by increasing access is discussed later in this report in Chapter Twelve, in the section on Manitoba Hydro's Access Management Plan.

Regarding woodlots affected by the project, the panel notes that one recommendation in this report concerns replanting shelterbelts on farms and another (following the section on visual impacts) will concern planting trees or shrubs to block the view of the project. In addition to providing compensation for loss of trees in woodlots, Manitoba Hydro should also support planting of trees to replace portions of woodlots lost to the project, at landowners' request. The panel will make a more general comment about contributions to woodlot development further in this report.

Although the panel is satisfied that Manitoba Hydro is taking adequate precautions to protect the large high-quality aquifer underlying a part of the RAA, the panel addresses the issue of aquifer protection in a broader way in Chapter Thirteen: Going Forward.

9.8 Visual Quality

9.8.1 Overview

The towers and cleared ROW will have a visual effect on the land crossed by the MMTP and on surrounding areas. The visual presence of the project has the potential to affect tourism and recreation, property values and quality of life. The effects of the visual presence of the project will vary from place

to place and from person to person. In some areas, where there are few other non-natural structures, the project will stand out more. In other areas, where there are already extensive modifications to the landscape or structures, the project may blend in with existing visual presences on the landscape. In forested areas, the visual presence of the towers and line may be blocked by trees, while in other areas the towers may be visible for well over one kilometre. Within the LAA for the project are semi-rural residential communities, rural communities, recreation areas and cultural sites where the project will be visible.

9.8.2 Visual Impact Study

In order to assess the visual impact, Manitoba Hydro carried out simulations of the post-construction view from a number of locations along the route of the transmission line. A total of 89 viewpoints were considered within the LAA for the project, which was a strip of land eight kilometres wide, centred on the transmission line. The larger LAA for this VC was intended to include all the land from which towers might be visible. Seventy-five of these viewpoints were excluded from the study because it was determined that the project would not be visible from them.

The study sought to quantify the visual impact by assigning scores for the prominence of the project in the post-construction view. Prominence refers to the degree to which an object would be present in an individual's central field of vision, i.e. whether it is in the foreground, middle distance or background, and whether it would be in the middle of a view or in the corner of a person's vision. The assessment also considered the visual sensitivity of the viewpoint, referring to the importance the public would attach to the view at that point.

The visual assessment simulated the effect of the project from seven viewpoints classed

as of high importance and seven classed as of moderate importance. To conduct the assessment, Manitoba Hydro took photos of the view toward the proposed ROW from each of the 14 viewpoints, and produced one photo showing existing alterations highlighted in red and a second with the project inserted into the image and also highlighted in red. The amount of the view that was currently altered from its natural state by development (including existing buildings, power lines and roads) was then calculated and compared to the amount of the view that would be altered after construction.

Starting from the Dorsey Converter Station and following the transmission line to the Minnesota border, the viewpoints examined were:

- a Hutterite colony northwest of Winnipeg;
 - a residence on Macdonald Road, south of Oak Bluff;
 - the Courchaine Bridge at the entrance to the Floodway, immediately south of Winnipeg;
 - along the Red River Floodway at Chrypko Drive and Two Mile Road;
 - residences along Prairie Grove Road, southeast of Winnipeg;
 - a residence near the RVTC about 15 km east of the Floodway on 58 N Road;
 - residences south of Anola along the RVTC on 58 N Road;
 - a Hutterite colony east of Highway 12, about 10 km south of Anola;
 - the community of Ste. Genevieve;
 - the Oakwood Golf Course;
 - the La Verendrye Golf Course;
- the Ridgeland Cemetery, north of the community of Sundown;
 - the access road to Sundown Lake; and
 - a Hutterite Colony south of Piney.

At these viewpoint locations, the distance to the nearest tower varied from 100 metres to 1.3 km. Two of the sites, the Oakwood Golf Course and Ste. Genevieve, were considered to have a view of the project obstructed by vegetation. Of the remaining 12 viewpoints, at 10 of them the towers would have a high prominence after construction, largely because they would be relatively close to the viewpoint.

The visual impact assessment concludes that the project will be highly visible from one of the Hutterite communities, the Ridgeland Cemetery, the Red River Floodway, Courchaine Bridge, La Verendrye Golf Club, and residences along Macdonald Road, 58 N Road and Prairie Grove Road. Manitoba Hydro states that efforts will be made through “tower spotting” – the actual placement of towers – to reduce the impact at the most affected areas.

What We Heard – Visual Quality

Visual quality was a large component of the presentations the panel heard during hearings held in La Broquerie. Several of the presenters were local residents who said the project would spoil the view from their properties. One presenter spoke of the ROW running down two sides of her property. Others brought photos of their properties to indicate the visibility of the project from their decks or gardens.

A witness for one participant group recommended the use of monopole towers on the grounds that they are less visually obtrusive than the steel lattice

towers planned by Manitoba Hydro. The witness said some countries in Europe are switching to monopole towers in order to make transmission lines more acceptable to the public. The height of the towers is also a factor in visual impact. The witness recommended using lower towers. Manitoba Hydro replied that lower towers would need to be spaced more closely together in order to allow for the same safe clearance of the conductors above the ground and thus more towers would be required to support the line.

The panel also heard criticism that in its assessment of visual impacts, Manitoba Hydro did not seek out viewpoints of importance to Indigenous people. Three golf courses were included, but there appeared not to be an effort to consider the visual impact from places of traditional land and resource use. It was reported through the Metis Traditional Land and Resource Use study that many harvesters prefer not to carry out their activity where developments such as power lines are visible, so visual quality has an impact on that VC as well.

Commission Comment – Visual Quality

The impact of the project on visual quality depends a great deal on distance from the transmission line, tower placement and the presence of trees capable of screening the view. In many parts of the LAA, existing forests will serve to screen the project from most viewpoints. For area residents who will be close to the ROW and have no trees between their properties and the project, the line will create a substantial change in their view. Manitoba Hydro stated during the hearings that at the landowners' request it will replant shelterbelts removed in agricultural areas. For rural residential property owners, there may be opportunities to reduce the visual impact of

the line through planting of trees and shrubs. Manitoba Hydro should work with property owners to minimize such visual impacts to the greatest extent possible. Concerns brought forward by Indigenous participants also highlighted the importance of considering visual impacts on traditional-use areas and activities.

Licensing Recommendation

The commission recommends that:

- 9.4 Manitoba Hydro offer to residents to plant shrubs or trees in order to screen the view of the project from residences in close proximity to the ROW.

Non-Licensing Recommendation

The commission recommends that

- 9.5 Manitoba Hydro, in future projects, also consider the visual impact of a transmission line on traditional land and resource use.

9.9 Human Health Risk

9.9.1 Overview

The human health risk assessment conducted for the project considered four potential pathways for an effect on human health: changes to air quality; changes to the quality of country food, especially those resulting from herbicide use in vegetation management; increases in noise; and electrical and magnet fields (EMFs) created by the transmission line. For the human health VC, the LAA consisted of the area within one kilometre on each side of the project.

9.9.2 Air Quality

Air quality can be affected by emissions from vehicles during construction and maintenance, which will emit sulfur dioxide (SO₂), nitrogen dioxide (NO₂) and carbon monoxide (CO), and from particulate matter, produced by burning of slash during ROW clearing and as dust during construction and maintenance. Manitoba Hydro plans to carry out burning only during winter and do so away from permanent residences. Dust management will also be carried out. During the life of the project, including construction and the operations and maintenance phase, emissions of nitrogen oxides will total approximately 41 tonnes, emissions of carbon monoxide will total approximately 73 tonnes and emissions of particulate matter will total approximately 1.5 tonnes. By way of comparison, Manitoba Hydro states that Winnipeg Transit's fleet of more than 500 diesel buses emits approximately 1,150 tonnes of nitrogen oxides, 248 tonnes of carbon monoxide and 81 tonnes of particulate matter per year.

9.9.3 Country Food Quality

The term "country food" can be used both for domestically produced food from private, non-commercial gardens, and for food produced by hunting, fishing or gathering. The human health risk assessment for the project considered the potential for impacts on the quality of country food as a result of the application of herbicides during maintenance. Certain of these chemicals could enter the food chain if they are taken up in plants or soil organisms, leading eventually to their presence in food eaten by people. Manitoba Hydro states that the two main herbicides used in ROW maintenance will be Garlon (active ingredient triclopyr) and Aspect Herbicide (active ingredient 2,4-D). Manitoba Hydro stated that Health Canada's Pest Management Regulatory Agency has concluded that

these products can be used safely when the instructions on the labels are followed. A Health Canada review of the safety of 2,4-D in 2008, carried out by an independent panel of government and university researchers in toxicology, epidemiology and biology, concluded that it can be used safely when used in accordance with the label instructions.

Herbicides are not used as part of the clearing of a right-of-way. They are used during maintenance to target woody vegetation and broad-leaved plants, while leaving low-level flowering plants and grasses largely unaffected. The goal in non-agricultural portions of the ROW is to have a ground cover of bushes and shrubs that will out-compete tree seedlings for available sunlight and moisture. Ideally, Manitoba Hydro states in the EIS that its goal is for additional herbicide applications to be required only every 15 years or less frequently. A photograph of a transmission ROW was shown during hearings and described as depicting a successfully managed area that has likely only required treatment twice in the last 20 years. Manitoba Hydro is required by law to follow provincial regulations on herbicide use, including ensuring that workers applying the herbicides have the appropriate training and licence and advertising its planned herbicide application. In addition to these regulations, Manitoba Hydro has stated it will use non-chemical means of vegetation management in sensitive areas, including those identified through ATK or land and resource use studies as sites for gathering berries or other harvesting of country foods.

In order to prevent berry bushes and other plants from being destroyed during construction, plant harvesting areas will be marked prior to construction so that machinery will not enter them. A buffer zone of 15 metres, in which vegetation will be cleared by hand or feller buncher, will be used around these environmentally sensitive sites.

9.9.4 Noise

The project will create noise during construction through the use of machinery and the implosives used to fuse together lengths of conductor wire. To a lesser extent, movement of equipment during operation and maintenance will also create noise. The transmission line will also create audible sound through a process known as corona discharge. Corona discharge occurs when the electrical field along the surface of the conductor wire creates a flow of electrical current in the air, resulting in an audible sound. Transmission lines are designed to minimize corona discharge, but during wet weather (rain or fog) water droplets in the air can increase corona discharge.

Construction noise will be temporary and intermittent. Sources of noise will be within the PDA (bulldozers, graders, trucks, pneumatic tools, etc) and Manitoba Hydro estimates that at a distance of 480 metres from the noise source, the construction noise would be about 59 decibels, approximately the same as a normal conversation. With the exception of implosions for splicing conductor wires, the maximum noise during construction, measured within the PDA, would be approximately 89 decibels, which is comparable to the noise of diesel truck. Implosions create a sound, measured at 110 decibels, described as similar to a shotgun blast.

Residences located within the LAA will, during construction, experience some audible noise. Maintenance will result in periodic audible noise, both from vehicles used in inspections and maintenance and tools used for clearing brush, but this noise will be infrequent and will last a short time in any one location.

Manitoba Hydro modeled noise from corona discharge at eight locations along the

transmission line and estimated it to range during fair-weather conditions from 17 to 23 decibels, at the edge of the ROW. This is comparable to the sound of whispering (20 decibels). In wet weather, audible noise would range from 41 to 63 decibels, although this noise might be masked by the noise of the rain itself. The Manitoba Provincial Guideline for outdoor ambient noise is 45 decibels at night and 55 in the day. As a result, noise guidelines could be exceeded in wet weather, but Manitoba Hydro states that a specific limit is not enforced – rather Manitoba Sustainable Development responds to complaints and may require steps to reduce noise. Addition of equipment at the Dorsey, Riel and Glenboro South stations will lead to noise levels as high as 52, 44 and 55 decibels, respectively, at the residences nearest to the three stations.

9.9.5 Electrical and Magnetic Fields

Transmission lines such as that in the MMTP produce electrical fields, which are measured in volts per metre (V/m), and magnetic fields, which are measured in units of gauss (G) or milligauss (mG). Electric fields can be blocked by most objects, including fences, buildings and trees. The electric fields associated with transmission lines are of extremely low frequency, less than 300 Hz. Manitoba Hydro acknowledges that exposure to very powerful low-frequency electrical fields may be perceptible to people or may cause annoyance as a result of stimulation of nerves and muscles, although such very powerful electrical fields would be encountered in restricted areas within electrical facilities, rather than in places accessible to the general public. Standards are set by the International Commission on Non-Ionising Radiation Protection (ICNIRP), an independent advisory body recognized by the World Health Organization (WHO). The International Committee for Electromagnetic Safety (ICES) also sets reference levels for safety.

The strength of EMFs declines rapidly with distance from the source, in this case the conductor wires. At the edge of the ROW, the highest calculated electrical field is 0.8 kV/m, which is well below the reference levels for public exposure set by the ICNIRP and ICES (4.2 and 5.0 kV/m, respectively). The highest expected level of electrical field on the ROW is 10 kV/m, which is the recommended limit for electrical fields on an ROW, as established by ICES. The highest estimated electrical fields along the ROW will be within parts of the RVTC, where the MMTP will run adjacent to the existing M602F transmission line.

Manitoba Hydro made similar calculations for magnetic fields at the edge of the ROW and on the ROW. The highest calculated magnetic field at the edge of the ROW is 32 mG for times of peak loading. The highest calculated magnetic field within the ROW for times of peak loading is 225 mG. This compares to reference levels for public exposure of 2,000 mG (ICNIRP) and 9,040 (ICES). Based on these levels, Manitoba Hydro states that electrical and magnetic fields from the project will result in exposure below the limits of the reference levels.

The range in the levels of magnetic fields within or at the edge of the ROW overlaps the range of magnetic fields to which people are exposed in home and office settings. When standing or sitting near appliances, people are exposed to magnetic fields ranging from less than 10 mG to more than 1,000 mG. Office exposures to magnetic fields range from approximately 10 mG to close to 100 mG.

Manitoba Hydro submitted a summary of a number of national and international studies carried out since the 1970s to investigate health effects of electrical and magnetic fields. Epidemiological studies, which examine variables in the health of populations, have been carried out to determine if there is a connection between proximity to high-voltage

transmission lines and leukemia, brain cancer, breast cancer, Alzheimer's disease and other illnesses.

Since 2007, several large-scale studies of leukemia and residential location carried out in the United States, France, the U.K., Denmark and Italy have found no statistical relationship between childhood leukemia and living near a transmission line. One of those studies, cited by Manitoba Hydro, analyzed 53,000 children who had had cancer and 66,000 healthy children and found no correlation that would show children with leukemia or other cancer more likely to live near transmission lines. Similar studies examining brain and breast cancer – looking for a statistical correlation between the illnesses and living near a transmission line – also found no correlation. On the basis of the large number of international studies, the conclusions of national and international expert panels and modeling of the strength of EMFs in the MMTP ROW, Manitoba Hydro states that EMFs will have no effect on human or animal health.

What We Heard – Human Health Risk

Several presenters expressed concern about the health effects of electrical and magnetic fields surrounding the transmission line. Some presenters who live near the FPR said they were concerned about the effects of EMFs on the food they grow in their gardens. Others said they were concerned about EMF effects from walking or driving underneath the line.

The panel heard concerns from participants about the air quality effects resulting from burning of slash and idling of vehicles. A photo was presented showing large slash piles burning during the clearing of the ROW for the Bipole III Transmission Line.

The panel heard that the perception that country food may be less safe to eat because of proximity to the transmission line – as a result of EMFs or herbicides – could discourage people from eating country food. This could cause an impact on health if they substitute it with less healthy processed food.

The panel also heard from a resident of the area who said that a nearby Manitoba Hydro transmission line is audible from a long distance away.

Commission Comment – Human Health Risk

The panel notes that the global scientific consensus, gained through many long-term studies with access to large amounts of data, is that there is no conclusive evidence of health effects resulting from EMFs from transmission lines. Everybody who uses electricity is exposed to EMFs through home and office electronics, tools and appliances, often located on the body or held in the hands. It is worth remembering that the strength of these fields dissipates rapidly with distance and, in the case of electrical fields, they can be screened by trees and buildings. In even the closest residence to the project, electrical and magnetic fields from home electronics, appliances and tools are likely to be much stronger than any remaining electrical or magnetic field from the transmission line. Within cities like Winnipeg, transmission corridors are often favoured locations for recreation areas, bike routes and community gardens. Some office buildings, including Manitoba Hydro's former headquarters on Taylor Avenue in Winnipeg, are located adjacent to transmission corridors. The panel is satisfied that EMFs from the project are not cause for concern.

Regarding the use of herbicides for vegetation management, the panel defers to

Health Canada's safety testing and notes that workers who apply these products require a licence, in order to ensure appropriate use of herbicides. Existing commitments in the Environmental Protection Program, such as leaving a 30-metre buffer around waterbodies, adequately address potential health concerns. Nevertheless, the panel suggests that Manitoba Hydro sponsor research on minimizing the use of herbicides in ROW management. The use of herbicides will be discussed further in Chapter Twelve: Environmental Protection and Monitoring.

Regarding air quality, Manitoba Hydro's Construction Environmental Protection Plan already calls for limits on vehicle idling, where possible (it may not be feasible to shut off diesel vehicles on very cold days). In its report on the Bipole III Transmission Project, the commission recommended that Manitoba Hydro make efforts to minimize burning of slash where feasible. Given the distance of parts of the Bipole III line from communities and the fact that slash includes unmarketable vegetation, it is understandable that burning may have been necessary on that project. The panel encourages Manitoba Hydro to take steps to facilitate more use of the cleared vegetation, given that this project will take place in an area that is more accessible to markets for wood. Manitoba Hydro stated in the EIS for the MMTP that it also uses chipping and mulching to dispose of slash that cannot be otherwise used, but this is not always an option given the quantity of material to be disposed of. Manitoba Hydro stated that in some cases, such as where cleared vegetation is located some distance from a road and removing it for other use would require hauling it across wetlands, burning it may be the less harmful alternative. Where possible, however, Manitoba Hydro should take steps to facilitate use of cleared vegetation by community members. Reducing slash burning and idling of vehicles will help to reduce effects on air quality, and reducing

idling is something that all drivers can do to reduce their contribution to greenhouse gases (discussed in more detail in Chapter 11: Sustainable Development).

9.10 Effects on Community Health and Well-Being

9.10.1 Overview

The VC of community health and well-being focuses on the effect of social and economic change on human physical and mental health. These effects are different from those discussed in Section 9.9: Human Health Risk, which considered the potential for impacts from air emissions, herbicides, noise or EMFs resulting in effects on health. Potential causes of effects on community health and well-being are: changes in social and economic conditions, including an increase in population and a mobile workforce; stress and annoyance; changes in health in the Indigenous population if the alteration of the landscape leads to a reduction in country food consumption and traditional medicine use; and effects on health-care services resulting from additional demand. For this VC, the LAA included all the rural municipalities traversed by the project, as well as nearby towns and cities where health services may be used by workers on the project

9.10.2 Effects of Economic Activity and Mobile Workforce

The project will generate an estimated 124 person-years of direct construction employment on the transmission line and in the three stations. It is expected that most of the labour force will be hired from outside the LAA. Employment generally has positive effects on health. However, because construction employment will be relatively

short-term and the numbers of workers will be relatively small relative to the population of the LAA, this positive effect will be modest. Manitoba Hydro will work with contractors to promote local business participation in the project.

Large projects with temporary, mobile workforces can have an impact on community health by concentrating a large number of people at close quarters in work camps (sometimes leading to outbreaks of respiratory or gastrointestinal infection) and potentially through the off-work interactions with other people. However, Manitoba Hydro expects that the relatively small number of workers on the MMTP will minimize these effects. The project will be of relatively short duration in any given area. To prevent outbreaks of gastrointestinal illness, camp contractors will be required to maintain a camp that meets all applicable public health regulations. Manitoba Hydro will work with regional health authorities to ensure that strategies to reduce illness are in place.

9.10.3 Stress and Annoyance

Stress and annoyance can have consequences for physical health, including weakened immune systems, weakened functioning of the circulatory and metabolic systems and increased incidence of cardiovascular disease and Type 2 diabetes. Stress can also affect physical health by contributing to smoking, excessive alcohol consumption and less healthy eating habits. Uncertainty, changes in the landscape, concerns about EMF, effects on private property, noise, concerns about environmental impacts and other matters can all contribute to stress.

Manitoba Hydro notes that in the case of EMF, perceived risk can cause stress even if the scientific consensus is that there is no risk. The

corporation cited a study in the Netherlands, which found that health complaints increased for people living within 300 metres of a new transmission line and that health complaints increased even before the line was built. The study's author concluded that the perception of risk might have adversely affected well-being, much like a placebo effect.

Mitigation for stress and annoyance includes easement agreements for landowners and engagement programs to provide up-to-date information and receive feedback. Other mitigation measures that have been developed for impacts on land and resource use, visual quality and human health risk are also expected to reduce stress. These include avoiding damage to adjacent properties, minimizing dust and emissions, limiting noise-producing construction activities near houses to daytime hours and developing a communication protocol to inform affected parties about the use of blasting during the splicing of conductor wires.

9.10.4 Effects on Indigenous Health Resulting from Reduction in Country Foods and Traditional Medicine

A common concern heard during the FNMEP was that individuals were concerned that country foods and traditional medicines would be affected by the presence of the project. Concerns were that the project would reduce the availability of foods and medicines, either through direct destruction (in ROW clearing or building of access trails) or through contamination. Traditional resource use is an important determinant of health in Indigenous communities. Reduction in the consumption of country food may lead to increased consumption of less healthy processed food.

Mitigation to reduce the impact on country foods and traditional medicines includes

construction measures previously discussed, such as using existing roads and trails, reducing erosion and soil damage through construction during frozen conditions or using construction mats, clearing environmentally sensitive areas in a way that limits disturbance to the soil, clearly identifying plant harvesting areas and using selective clearing methods in them, carrying out construction during timing windows that reduce disruption to wildlife, conducting pre-construction surveys for mineral licks and stick nests, taking a variety of steps to avoid spreading weeds, and others. Manitoba Hydro notes that the route selected for the project avoids several identified plant harvesting areas. In total, the ROW traverses 36 kilometres of Crown land, which represents 0.5 per cent of the Crown land in the rural municipalities crossed by the project. Because of that, Manitoba Hydro expects the effect on health resulting from effects on country foods and traditional medicine to be minimal.

9.10.5 Effects on Health Care Infrastructure and Services

The project could affect health care infrastructure and services by placing extra demands on the health system, through occupational injuries, traffic accidents and health effects of a mobile workforce. It could also affect the local health care system if stress, annoyance and other factors cause the existing population of the area to need more services. A third potential effect is through increased traffic, which could impede emergency vehicles. However, Manitoba Hydro notes that project-related increases in traffic are expected to be minimal, so this is not expected to be a significant concern.

Measures to prevent these effects include working with RCMP and local governments and other organizations to make sure that services are coordinated; coordinating

with the local health authority regarding a mobile clinic; providing designated staff with emergency response training and informing staff of the emergency plan; providing first aid supplies, facilities and trained staff to deal with minor injuries; and providing group transportation for workers from camps to worksites to reduce the risk of traffic accidents.

Commission Comment – Community Health and Well Being

The panel considers that the scale of the MMTP makes it relatively unlikely that it will have any measurable effect on most parameters of community health and well-being, such as those associated with a mobile workforce or resulting from demands on health infrastructure. The panel is satisfied that Manitoba Hydro intends to work closely with regional health officials to address any potential issues.

Manitoba Hydro was asked how many hospital visits had been incurred by workers involved in the Bipole III project since its commencement. At the time of the question, early in 2017, there had been 59 visits by workers, with most being relatively minor (in 45 cases, the worker returned to work the next day). Considering that Bipole III is more than six times as long as the MMTP, and involved much more vegetation clearing, it is likely that the number of hospital visits for workers on the MMTP would be proportionately lower.

The project does appear to have caused some stress and anxiety among some area residents who are concerned about its effect on their quality of life. It will be necessary for Manitoba Hydro to take steps to reduce the visual impact, as discussed previously, and to reduce unwanted access to private land via the ROW (discussed in Chapter Twelve in

the section on the Access Management Plan) in order to minimize these effects on stress, annoyance and quality of life.

The panel notes the potential effect of the proximity of the transmission line on the gathering of country foods. Manitoba Hydro must work with Indigenous communities, including resource users and elders, to identify environmentally sensitive sites where plant harvesting is carried out and take other steps to minimize impacts on the gathering of traditional foods and medicines. There is a recommendation to this effect earlier in this report.

Chapter Ten

Accidents, Malfunctions and Unplanned Events

10.1 Overview

Accidents, malfunctions and unplanned events that could have effects on the natural or socio-economic environment include power outages, tower collapse, electrocution, failure of erosion-prevention and sediment-control measures, spills of hazardous materials, release of insulating gas, interconnection of aquifers (allowing underground water from shallow and deep aquifers to mix), fire and collisions. In its EIS, Manitoba Hydro described the steps to be taken to prevent these occurrences, the magnitude of the effects they could have and the risk of their occurrence.

10.2 Power Outages

Power outages can be caused by equipment failure, wildlife or equipment making contact with live wires, fires, tornadoes, ice storms or the line being brought out of service either intentionally or unintentionally by staff or safety equipment. Between March 2008 and June 2014, Manitoba Hydro reported 16 outages on 500 kV transmission lines, five of which lasted from eight to 17 days. Minimizing the risk of large-scale power outages that would result from damage to more than one major transmission line was the reason Manitoba Hydro sought to ensure a 10-kilometre buffer zone between the MMTP and the existing M602F line in the north-south portions of the route.

10.3 Tower Collapse

High winds associated with a severe thunderstorm caused 19 steel towers north of the Dorsey Converter Station to collapse in 1996, putting both Bipole I and II out of service. To prevent such an occurrence, Manitoba Hydro plans to make use of anti-cascading towers at regular intervals to prevent multiple collapses, in which one collapse causes the next tower to collapse. Extra-strengthened angle towers are used where there is a change of direction in the line, which causes additional forces on the tower.

10.4 Electrocution

Human or animal contact with live wires or electrical equipment could cause electrocution, although the most likely possibility of this would be if damage to the line (such as from a storm) caused a live wire to come in contact with the ground. Stations and ground level equipment will be fenced and secured.

10.5 Erosion/Sediment Control Failure

A failure of erosion- and sediment-control measures, particularly if it occurred during an extremely heavy rain or snow

melt, could cause sediment-laden runoff to enter waterways. Such an occurrence would affect fish habitat and water quality, likely restricted to the portions of the waterway close to where the incident occurred. Measures to prevent such an incident include the use of geotextile fabric on sensitive slopes and silt fences and settling ponds as required, as well as those measures described as part of Manitoba Hydro's Erosion-Protection and Sediment-Control Framework, such as winter construction, establishment of buffer zones where shrubs will be left in the ROW and avoidance of sensitive areas.

10.6 Spills of Hazardous Materials

A variety of hazardous materials, including fuels, lubricants, methanol, paint, solvents and herbicides, will be used in the PDA during construction and operations. Spills are more likely during construction than operation, as during that time there will be many more vehicles and pieces of equipment working in the area. During operation and maintenance, the potential exists for spills of herbicides used in vegetation management or fuels and lubricants used in vehicles. Some of these materials are hazardous to vegetation and terrestrial and aquatic life and could contaminate soil, surface water or groundwater sources. During construction of Bipole III, spills of hydraulic fluid, diesel fuel, anti-freeze and engine oil ranged in size from less than five litres to 300 litres.

Manitoba Hydro's Spill Response and Prevention Plan lists measures, including secondary containment for tanks larger than 230 litres, weekly inspections of tanks to prevent spills, and keeping storage locations at least 100 metres from open water, to prevent contamination of the water. All spills and leaks are to be reported, cleaned up and soil in the area sampled.

10.7 Release of Insulating Gas

Equipment used in converter stations such as Dorsey and Riel and stations such as Glenboro South is insulated with gases such as sulphur hexafluoride, which is mixed with nitrogen and carbon tetrafluoride. Sulphur hexafluoride and carbon tetrafluoride are greenhouse gases. Manitoba Hydro has leak detection and response measures in place and any release of insulating gas would cause the gas to be dissipated quickly into the atmosphere. These stations are not accessible to the public.

10.8 Interconnection of Aquifers

The potential exists when drilling into the ground that aquifers with different water chemistry may accidentally be connected. In such cases, the chemistry of the different aquifers can be mixed. If a saline aquifer and a freshwater aquifer were interconnected in this way, it would be possible for a source of drinking water to be contaminated. Potential also exists to contaminate an aquifer with surface water. Aquifers southeast of Winnipeg are considered highly vulnerable to contamination. Excavation for tower foundations will have the potential to contact relatively shallow aquifers. Geotechnical drilling will also have some potential to contact deeper aquifers. Using a qualified driller and having an emergency plan in place to seal holes and/or pump out the potentially contaminated water are steps to address this potential effect.

10.9 Fires

During clearing of the ROW, non-merchantable and undesired debris and

slash will be burned. As well, the potential exists for fires to be started accidentally as a result of engine heat. Fires could affect crops, forest resources, wildlife and habitat, cultural and historic resources, recreation, infrastructure and services and human health. Forest fires can also cause a flashover and short circuit a line, leading to a power outage. During construction of the Bipole III line, two fires in 2015 affected 108 and 10 hectares of land. Burning of slash outside of the period November 16 to March 31 requires a permit from Manitoba Sustainable Development. Manitoba Hydro's Construction Environmental Protection Plan specifies rules for burning waste, including having staff and firefighting equipment on hand during burning, burning only on mineral soils, and at the end of the season scanning all burn piles using infrared technology to look for hotspots. As well, staff are trained in the use of fire-fighting equipment.

10.10 Collisions

During construction, increases in the amount of traffic in and around the project area can lead to collisions between vehicles or collisions with wildlife. The potential also exists for agricultural equipment, other vehicles or aircraft involved in aerial applications to collide with the transmission line towers. In addition to collisions endangering people, the potential exists for collisions with wildlife, especially during the increase in traffic that will be caused by construction. Manitoba Hydro's transportation plans for workers are intended to minimize the risk of vehicular collisions or collisions with wildlife. Relatively little of the proposed new ROW crosses areas where aerial applications occurs, as much of the agricultural land in the area of the new ROW is hayland or pasture.

Commission Comment – Accidents, Malfunctions and Unplanned Events

Planning for uncertainty was a topic mentioned several times during the hearings. By their very nature, “unplanned events” are uncertain, whether they result from human error or from unexpected weather extremes or some other cause. The panel notes that many of the potential occurrences Manitoba Hydro discussed under this heading are addressed in the corporation's Environmental Protection Plans. Preparing detailed responses for such events is one way of preparing for uncertainty. Another way to prepare for uncertainty is to have mechanisms in place to monitor what happens and to learn from these events and adapt. The panel makes several recommendations on these topics in Chapter Twelve, particularly in the sections dealing with monitoring.

Chapter Eleven

Sustainable Development

11.1 Overview

The concept of sustainable development was popularized by the World Commission on Environment and Development in its 1987 report “Our Common Future” as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Since then, the concept has been used to integrate environmental, social and economic considerations in project planning. It is mandated in Manitoba by *The Sustainable Development Act* and in Canada by the *Federal Sustainable Development Act*. Manitoba developed a strategy in 2000 for implementing sustainable development in the province, following passage of the act in 1998.

The Manitoba Round Table on Environment and Economy promotes the following as the principles and guidelines of sustainable development:

Principles

1. INTEGRATION OF ENVIRONMENTAL AND ECONOMIC DECISIONS: requires that we ensure economic decisions adequately reflect environmental impacts including human health.

Environmental initiatives shall adequately take into account economic consequences.

2. STEWARDSHIP: requires that we manage the environment and economy for the benefits of present and future generations. Stewardship requires the recognition that we are caretakers of the environment and economy for the benefit of present and future generations of Manitobans.

A balance must be struck between today’s decisions and tomorrow’s impacts.

3. SHARED RESPONSIBILITY: requires that all Manitobans acknowledge responsibility for sustaining the environment and economy, with each being accountable for decisions and actions, in a spirit of partnership and open cooperation.

4. PREVENTION: requires that we anticipate, prevent or mitigate significant adverse environmental (including human health) and economic impacts of policy, programs and decisions.

5. CONSERVATION: requires that we maintain essential ecological processes, biological diversity and life-support systems of our environment; harvest reusable resources on a sustained yield basis; and make wise and efficient use of our renewable and non-renewable resources.

6. **WASTE MINIMIZATION:** requires that we endeavour to reduce, reuse, recycle and recover the products of our society.
7. **ENHANCEMENT:** requires that we enhance the long-term productive capability, quality and capacity of our natural ecosystems.
8. **REHABILITATION AND RECLAMATION:** requires that we endeavour to restore damaged or degraded environments to beneficial uses. Rehabilitation and reclamation require ameliorating damage caused in the past. Future policies, programs and developments should take into consideration the need for rehabilitation and reclamation.
9. **SCIENTIFIC AND TECHNOLOGICAL INNOVATION:** requires that we research, develop, test and implement technologies essential to further environmental quality including human health and economic growth.
10. **GLOBAL RESPONSIBILITY:** requires that we think globally when we act locally. Global responsibility requires that we recognize there are no boundaries to our environment, and that there is ecological interdependence among provinces and nations. There is a need to work co-operatively within Canada and internationally to accelerate the merger of environment and economics in decision making and to develop comprehensive and equitable solutions to problems.

Fundamental guidelines

1. **EFFICIENT USE OF RESOURCES:** we shall encourage and support development and application of systems for proper resource pricing, demand management and

resource allocation together with incentives and disincentives to encourage efficient use of resources and full environmental costing of decisions and developments.

2. **PUBLIC PARTICIPATION:** we shall establish appropriate forums which encourage and provide opportunity for consultation and meaningful participation in decision-making processes by all Manitobans. We shall endeavour to ensure due process, prior notification and appropriate and timely redress for those affected by policies, programs, decisions and developments.
3. **UNDERSTANDING AND RESPECT:** we shall be aware that we share a common physical, social and economic environment in Manitoba. Understanding and respect for differing social and economic views, values, traditions and aspirations is necessary for equitable management of these common resources. Consideration must be given to the aspirations, needs and views of various regions and groups in Manitoba.
4. **ACCESS TO ADEQUATE INFORMATION:** we shall encourage and support the improvement and refinement of our environmental and economic information base and promotion of the opportunity for equal and timely access to information by all Manitobans.
5. **INTEGRATED DECISION MAKING AND PLANNING:** we shall encourage and support decision-making and planning processes that are open, cross-sectoral, incorporate time horizons relevant to long-term implications and are efficient and timely.
6. **SUBSTITUTION:** we shall encourage and promote the development and use of substitutes for scarce resources where they are both environmentally sound and economically viable.

Manitoba Hydro referred in the environmental impact statement (EIS) to the Manitoba government's revised Green Plan, passed in 2014 as part of its Tomorrow Now initiative, which included an eight-year strategic action plan for protecting the environment while ensuring a prosperous and environmentally conscious economy. As part of this development, clean energy, energy efficiency and waste management were identified. The report cited Manitoba's potential to become a regional clean-energy provider through increases in generation and transmission capacity.

11.2 MMTP and Sustainable Development

Manitoba Hydro refers in the EIS to its Preferred Development Plan, which it developed in order to meet its mandate of providing affordable and reliable energy to meet Manitoba's future demands. This plan, which included construction of the Keeyask Generating Station and a new transmission interconnection to the United States, was the subject of a Public Utilities Board (PUB) review. The terms of reference for the PUB review included considering the extent to which the plan was aligned with *The Sustainable Development Act*. The PUB concluded that the transmission interconnection would add value to Manitoba Hydro's future plans and would contribute to system reliability. It recommended authorization to proceed with the transmission interconnection, subject to environmental approval.

In the EIS, Manitoba Hydro summarizes the ways the MMTP supports the traditional three pillars of sustainable development: environment, economy and social responsibility.

In terms of the environment pillar, the project contributes to reductions in greenhouse gas (GHG) emissions by displacing electricity generated by gas or coal in export markets. As well, the project was planned with environmental considerations in the EPRI-GTC route-planning methodology in order to reduce potential effects on the environment. Manitoba Hydro notes that legally protected areas were identified early in the process as "areas of least preference" where the line would not be routed, and other environmental criteria, such as wildlife habitat and stream crossings, were factored into the models used for comparing thousands of potential routes.

In terms of the economy pillar, Manitoba Hydro states that the project is intended to help Manitoba maintain low electricity rates and notes that lower-cost electricity has helped Manitoba's economy by attracting many employers. As well, Manitoba Hydro states that the project is designed to enhance reliability by increasing its ability to import electricity in times of drought.

The social pillar is balanced through the comprehensive multi-year engagement processes, which included funding of Aboriginal traditional knowledge (ATK) and traditional land and resource use studies and multiple rounds of open houses, meetings and communications during the route-selection process.

11.3 Greenhouse Gas Life-Cycle Assessment

Manitoba Hydro contracted a greenhouse gas (GHG) assessment of the MMTP, as a component of its sustainability assessment. The assessment concluded that the project will generate approximately 171,000 tonnes of CO₂ equivalents over its lifetime, from construction through to decommissioning. (The term

CO₂ equivalent means that emissions of other greenhouse gases, such as methane, are considered in terms of the quantity of CO₂ it would take to have the same greenhouse gas effect.)

The transmission line is the main contributor to GHG emissions resulting from the project, contributing more than 165,000 tonnes, compared to just under 6,000 tonnes for the upgrades to the Glenboro South, Dorsey and Riel stations. The two main contributors to GHG emissions are land-use changes, contributing 44.7 per cent of all GHG from the project, and construction materials, also contributing 44.7 per cent. The term “land-use changes” refers primarily to forest land in the ROW that is converted to grass and shrub land and as a result no longer stores carbon in the form of wood. In calculating GHG emissions from construction materials, the life-cycle assessment estimated the emissions produced to manufacture materials, such as the aluminum in the conductor wires, the steel used in the towers, the cement used in concrete foundations and the wood matting that construction vehicles drive on in wet or sensitive areas. The project will require 6,363 tonnes of steel, 3,838 tonnes of aluminum, 10,884 tonnes of concrete and 8,650 tonnes of wood matting. Aluminum production is the largest source of GHG emissions in the project.

Construction activities will contribute about 6.7 per cent of the total GHGs: four per cent for transportation of materials and 2.7 per cent for on-site construction. Over the life of the project, maintenance will contribute about 1.6 per cent of the total GHGs. Decommissioning is estimated at 2.3 per cent of the total.

The life-cycle assessment examined only the GHG emissions of the MMTP, and not the effect on GHG emissions resulting from the generation of the electricity that will be

transmitted through the line. The assessment noted that effects on GHG emissions resulting from the generation of electricity can be much larger than effects resulting from transmission. According to Manitoba Hydro’s assessment report, a hydro-electric generating station the size of the Keeyask Generating Station could displace up to 30 million tonnes of CO₂ equivalent in 10 years if it replaces the burning of coal to generate electricity. (This would be a theoretical maximum, assuming all of the electricity replaces the burning of coal). In the case of the MMTP, because it will be used to export hydro-electricity, which will replace electricity generated by burning of fossil fuels, the project is expected to contribute to a reduction in GHGs that would otherwise be generated in the export market.

11.4 Cumulative Effects

The term “cumulative effects” refers to effects from a project that work in combination with effects from other past, present or future activities. Often, effects from individual projects or activities may appear to be small or insignificant, but as many such effects add up over time, a much more substantial effect is felt in the environment. The EIS for the MMTP dealt with cumulative effects in the assessment of each valued component (VC) rather than as a stand-alone chapter.

For each VC, the EIS listed a number of present or future activities within the Regional Assessment Area (RAA) that may have overlapping effects. Activities listed included:

Past and present

- Agriculture (conversion of land, livestock operations, cropping and land drainage)
- Residential developments
- Existing linear developments

- Other resource activities (forestry, mining, hunting, trapping, fishing)
- Recreational activities

Future

- Bipole III Transmission Project
- St. Vital Transmission Complex
- Dorsey to Portage South Transmission Project
- Northwest Winnipeg Natural Gas Pipeline Project
- Richer South Station to Spruce Station Transmission line
- Energy East Pipeline
- South End Water Pollution Control Centre upgrade (currently under way)
- St. Norbert bypass
- Headingley bypass
- Oakbank highway corridor
- Natural gas upgrade projects
- Manitoba highway upgrades
- Piney-Pinecreek Border Airport expansion

Some of these activities, such as the Headingley bypass and the Oakbank highway corridor, will occur in areas where land has already been modified and will affect little or no natural habitat. Others, however, will act cumulatively with the MMTP. The St. Norbert bypass will remove a portion of riparian forest along the La Salle River less than two kilometres upstream of the MMTP. The transmission line from the Richer South station to the planned Spruce Station (to be

located to the east near Whiteshell Provincial Park) will intersect some large patches of relatively intact forest. Together, the MMTP, the St. Vital Transmission Complex and Bipole III will add three new transmission line crossings of the Red River (the St. Vital line will be adjacent to the MMTP, while Bipole III crosses 20 km to the south), so they will have a cumulative effect on bird-wire strikes. The EIS states that there are no anticipated projects that will act cumulatively with the MMTP in the area of the Sundown and Caliento wetlands.

Manitoba Hydro concludes that the project's contributions to cumulative effects are not significant. In the area of wildlife habitat availability, for example, the project will directly alter 550 hectares of wildlife habitat, which Manitoba Hydro states is 0.1 per cent of the overall change in wildlife habitat that has resulted from past and present activities within the RAA. Within the smaller Local Assessment Area (LAA), the project will result in a 4.8 per cent reduction in habitat availability. Manitoba Hydro states that a 10 per cent reduction in habitat availability has a low significance for species not at risk, and a five per cent reduction has a low significance for species at risk. Manitoba Hydro concluded that the project's contribution to cumulative effects on traditional land and resource use will be moderate, because it will reduce by a small amount the land available for traditional uses within the RAA. Because many of the important locations cited through ATK and traditional land and resource use studies are outside the LAA, and because native vegetation within the project's footprint makes up only 0.3 per cent of that available within the RAA, Manitoba Hydro characterizes the cumulative effect of the project as not significant. Similar assessments are made for the contribution of the MMTP to cumulative effects on other VCs.

What We Heard – Sustainable Development

Participants expressed concern regarding the width of the ROW and the amount of clearing that would be required for the project. It was argued that minimizing the width of the ROW would reduce the GHG contribution resulting from land-use changes. It was also argued that Manitoba Hydro's GHG calculations and its purchasing policies should consider the origin of the steel used in transmission towers, as some countries produce steel using technology that produces more GHGs than others. The GHG assessment was based on the assumption in the analysis that the project would use steel produced in India. This was intended as a conservative assumption, in order not to underestimate GHG production from steel manufacturing.

Fuel consumption during construction was also a concern. One participant expressed doubt about the estimates for fuel use, especially regarding the amount of fuel used by the heavy-lift helicopters involved in erecting transmission towers. The participant also expressed concern about burning of slash from clearing of the ROW, urging Manitoba Hydro to ensure that the material is available for use as firewood or for biomass.

A witness for one participant discussed global climate patterns and the evidence that climate change is already having serious effects. This witness pointed to the accelerated pace of the melting of permafrost and sea ice and to the effects of global changes in ocean temperatures on the weather-creating arctic jet stream. These effects, which are already causing more intense storms and droughts, indicate that climate change must be addressed in project planning.

Another witness for the same participant discussed the challenges of habitat mitigation. International studies have shown that

mitigation efforts often fail to prevent negative environmental effects, the witness said, particularly regarding mitigation of wetlands. Because of questions about the effectiveness of mitigation measures, it is important to apply a precautionary principle. Mitigation measures cannot be assumed to prevent negative effects on the environment. As this participant noted, around the world thousands of projects are assessed as having no significant effect on the environment after the application of mitigation measures, and yet the global environment continues to be degraded. Sustainability requires that small effects be considered in such a global context.

This witness also argued that new thinking on sustainability calls for projects not just to reduce their environmental impact but to make a positive contribution to sustainability. A sustainability-based environmental assessment would account for all negative externalities in a project, including habitat destruction, loss of carbon storage and changes in cultural values. This witness encouraged use of the concept of ecosystem services to see how economic benefits and environmental protection are connected. Such an approach would make explicit the economic value of the environment in areas such as water storage and purification, air purification, carbon sequestration and climate regulation.

Another participant stated, however, that the ecosystem-services approach would run counter to the perspective of some Indigenous people, who would not wish to place an economic value on the natural environment.

Manitoba Hydro's definition of "significance" was called into question by another participant. The corporation used the relative size of areas affected as a measure of significance in order to conclude that the project will not have significant effects. But this participant said that to resource users affected by the project, the question of

significant or not significant would be better expressed as “not acceptable” or “acceptable.” To these resource users, the effects of the MMTP in areas they use for harvesting would be “not acceptable.”

Commission Comment – Sustainable Development

As stated previously in this chapter, the three pillars of sustainable development are environment, economy and society. After review of the EIS and supporting materials, hundreds of information requests and all the evidence brought forward during 18 days of hearings, the panel is satisfied that the MMTP has sought to address both environmental and socio-economic issues. This is indicated by the engagement and route-selection processes. Manitoba Hydro gathered information and sought viewpoints through funded ATK and traditional use studies, community open houses, one-on-one meetings with landowners, mass mailings of postcards, advertising, plain-language documents, key person interviews and other techniques. Landowners, residents of the planning area, members of First Nations and members of the Manitoba Metis Federation made their views known. This information and these concerns were used in a route-selection process that attempted to balance a very large number of environmental and socio-economic concerns. As the commission commented in Chapter Seven, the route-selection process, though it has room for improvement, is an example of an activity guided by the principles of sustainable development. As for the economy pillar, the large economic picture is outside the terms of reference of these hearings and was the subject of the Public Utilities Board hearing, although effects on the local economy in the project area were discussed in the EIS and

the hearings. However, there is room for Manitoba Hydro to ensure that the economic benefits of the project are shared by communities with an interest in the planning area. The commission urges Manitoba Hydro to ensure that local communities and Indigenous people in Manitoba are able to benefit from employment opportunities.

In its discussion of sustainable development, Manitoba Hydro notes that the project fits with the vision in Manitoba’s Green Plan for clean energy, energy efficiency and waste reduction. Several other points discussed in this plan have relevance for the MMTP. The plan calls for the province to work with the forestry sector to shift from burning woody debris to using it as a source of biomass. The plan calls for the province to seek public input on developing a new strategy for safe and environmentally sustainable all-terrain vehicle (ATV) use. The plan calls for a policy to offset habitat loss on a project-by-project basis. On the question of burning slash, Manitoba Hydro stated that it will attempt where possible to make wood available for use. The commission has repeated a recommendation from the Bipole III report that Manitoba Hydro make efforts to find uses for slash. Concerns about the impact of ATV use along the new ROW are discussed in Chapter Twelve: Environmental Protection and Monitoring, but the panel notes here that the growing network of informal trails that develops around a transmission line ROW is a clear illustration of a cumulative effect. As for offsets, Manitoba Hydro was urged in the hearing by one participant group to compensate for any Crown land affected by the project. Manitoba Hydro’s response to this was that, since the Crown land traversed by the ROW is still Crown land and will still be habitat for plants and wildlife, offsets are unnecessary.

The panel is aware of projects (Amprion, 2016, Yahner and Hutnik, 2005) that have

been carried out in other jurisdictions that have examined clearing and managing transmission line ROWs in such a way as to contribute to sustainability. Manitoba Hydro's plan for creating golden-winged warbler habitat, described in Chapter Eight, indicates the potential for the MMTP to make such a contribution as well. There may be other ways in which clearing the ROW to create a more natural edge and a more diverse mix of vegetation could create beneficial habitat. Such an approach might also reduce somewhat the contribution to GHGs made by land-use changes and is subject to discussion in Chapter Thirteen: Going Forward.

However, even if such efforts create a viable shrubland in the ROW, this will still be a change in the environment and a reduction in the amount of forest in this portion of southeastern Manitoba. The panel heard many concerns, described in 9.9 Traditional Land and Resource Use, about the long-term loss of land suitable for carrying out traditional hunting and harvesting activities and about the decline in forest in the region since 1930. Given the context of long-term reduction in forest land in the region, support by Manitoba Hydro for conservation and reforestation projects in southeastern Manitoba would help to enhance ecological sustainability in the region.

The panel also heard about the cumulative impact on intact habitat throughout the region. Forestry activities, forest fires and expansion of roads and trails (many of which are heavily used by off-road vehicles) have diminished intact habitat in an area that already has two high-voltage transmission line ROWs. Given that the MMTP is being built in a region that is close to a large portion of Manitoba's population and is used by industry, traditional and recreational users, and is likely to have treaty land entitlement selections in the future, an

ecological sustainability assessment as part of a large-area planning initiative for the region, to be carried out by the province of Manitoba, would be worthy of consideration. This concept is discussed in greater detail in Chapter Thirteen: Going Forward.

In the EIS for the project, Manitoba Hydro assessed cumulative effects for each VC. Therefore, the discussion for each VC occurred in the relevant specific chapter of the EIS. The panel considered this appropriate, as cumulative effects need to be understood at the level of each specific component of the environment. However, it would have been beneficial to see one consolidated chapter on cumulative effects as well. A summary of cumulative effects was provided in the conclusion of the EIS, but the panel considered it too short to allow for a full understanding of the matter. Dispersing cumulative effects assessment throughout the report in individual chapters, while logical, made it difficult for readers to easily see the full picture.

The panel notes that the cumulative effects of the project on the natural environment have been reduced by Manitoba Hydro through use of existing transmission corridors, twinning the transmission line with existing linear developments and selecting a route through areas that are already disturbed and influenced by human beings. As both Manitoba Hydro and one expert witness pointed out, much of the study area has been impacted by past activities, primarily the conversion of natural areas to agricultural land. Manitoba Hydro noted that effects from identified future activities will have limited spatial overlap with the MMTP.

The panel notes that had Manitoba Hydro located the project farther east and on more Crown land, the cumulative effect on the natural environment (native vegetation, wildlife habitat) would have been greater.

Furthermore, this would also have resulted in increased cumulative effects on traditional land and resource use.

In order to carry the commitment to sustainable development to the next step, Manitoba Hydro should select suppliers of materials and services on the basis of their compliance with the principles and guidelines of sustainable development. Beyond this, bid packages should also include the definition of criteria that will be used by Manitoba Hydro to differentiate suppliers on the basis of their contribution to greenhouse gas emissions. The panel agrees that exports of power using the transmission line will displace the burning of fossil fuels. Therefore, the MMTP has the potential to help in meeting overall GHG emission targets. This fact notwithstanding, manufacturing of the materials used in the project will generate many thousands of tonnes of GHGs. There may be room to reduce that contribution through Manitoba Hydro's purchasing and contracting policies. Manitoba Hydro should insert language in its bid packages for projects such as the MMTP to the effect that suppliers' contributions to GHG emissions, and those of other manufacturers in their chain of suppliers, will be considered in evaluating bids. Such an approach, if broadly taken, could provide an incentive for low-cost manufacturers of energy-intensive materials like steel and aluminum to improve their processes and emission controls.

Licensing Recommendation

The commission recommends that:

- 11.1 Manitoba Hydro include criteria regarding GHG emissions throughout the supply chain in its selection process for suppliers and contractors for the Manitoba-Minnesota Transmission Project.

Non-Licensing Recommendation

The commission recommends that:

- 11.2 Manitoba Hydro, in future environmental impact statements, include a more complete discussion of project cumulative effects that brings together materials for all VCs and the project area.



Chapter Twelve

Environmental Protection and Monitoring

12.1 Overview

Manitoba Hydro's approach to environmental protection, management and monitoring incorporates lessons from previous projects, improved understanding from Aboriginal traditional knowledge (ATK) and traditional land and resource use studies and a philosophy of adaptive management. Adaptive management is a process of environmental management that includes planning, implementation, evaluation and adjustments, so that as new understanding develops the response can be changed. Manitoba Hydro's Environmental Management System, its framework for developing, managing and evaluating environmental policies, is certified under the International Standards Organization's ISO 14001 standard.

Manitoba Hydro's Environmental Protection Program was developed for the Bipole III Transmission Project, which was licensed in 2013. This program, which has since been used for other Manitoba Hydro transmission projects, will be employed for the MMTP. It includes a series of specific plans governing various aspects of construction and operation of the MMTP, plus information management systems, communications initiatives and other resources necessary for protection and monitoring of the project and its effects on the environment.

Specific components of the program are:

- a monitoring plan for the biophysical and socio-economic environment;
- a system of inspections and monthly and annual reports;
- a series of Environmental Protection Plans (EPPs) for construction, operations/maintenance, decommissioning and culture and heritage resources;
- a series of management plans for access, blasting, emergency preparedness, erosion and sediment control, rehabilitation and weeds, and waste and recycling;
- a suite of communication tools, including community engagement, a project website, an information line, annual reports and community liaisons; and
- resources within Manitoba Hydro or contracted by Manitoba Hydro to support the various aspects of the program, including environmental inspectors, environmental monitors and specialists, and an environmental management information system.

12.2 Environmental Protection Plans

Of the four Environmental Protection Plans for the project, the one that currently has the largest amount of detail is the Construction Environmental Protection Plan (CEPP). The CEPP will include a large number of measures to protect environmentally sensitive sites that were identified through the environmental assessment, the Public Engagement Program (PEP) and the First Nations and Metis Engagement Program (FNMEP). Manitoba Hydro prepared a draft of the CEPP for review through the engagement and regulatory process, including the hearings. The CEPP contains a series of aerial photos of the transmission line route, on which sensitive sites, such as wetlands, stream crossings, important habitat, areas with potential for heritage resources and recreation

sites, have been identified. These photo sheets are intended to provide managers, supervisors and staff working for Manitoba Hydro and its contractors with environmental protection instructions for specific locations along the route. Specific instructions for protecting identified sensitive areas on the maps are included. In addition to the photo sheets, the CEPP includes a long list of mitigation measures categorized under the headings of different constructions activities. For each activity, specific instructions are given, such as, under the heading of “Access Roads and Trails,” the requirement to decommission and rehabilitate access roads and trails that are no longer required, or under the heading of “Clearing,” the requirement to maintain a buffer of at least 30 metres around waterways in which shrubs and understory vegetation will be maintained.

The Construction Environmental Protection Plan contains lists of mitigation measures for each of the following categories:

Access roads and trails	Draining	Rights-of-way
Agricultural areas	Drilling	Safety and health
Aircraft use	Emergency response	Soil contamination
Blasting and exploding	Erosion protection and sediment control	Staging areas
Borrow pits and quarries	Fish protection	Stream crossings
Built-up and populated areas	Grading	Stripping
Burning	Grubbing	Transmission towers and conductors
Clearing	Hazardous materials	Treated wood
Construction camps	Heritage resources	Vehicle and equipment maintenance
Demobilizing and cleaning up	Management measures	Waste management
	Petroleum products	Wetlands
	Rehabilitating and re-vegetation	Wildlife protection

While cultural and heritage resources are covered within the Construction Environmental Protection Plan, they are also the subject of their own separate protection plan. A draft of the Culture and Heritage Resources Protection Plan was filed as a supplement to the EIS. The draft contains instructions for the steps to be taken in the event that human remains, artifacts or other heritage resources are discovered during construction and for the monitoring of known cultural and heritage resources for signs of disturbance. The draft plan also contains templates for the development of protocols to be included in the final version of the plan. These templates specify information to be gathered from communities, so that during construction Manitoba Hydro will know which communities and individuals to contact, the specific areas of interest of different communities, types of heritage resources that may be present, any ceremonial or spiritual activities the community would like to practise prior to construction and other relevant subjects. Results of cultural- and heritage-resources monitoring will be shared through the FNMEP as well as through an annual Heritage Resources Impact Assessment report prepared for the Manitoba Historic Resources Branch in accordance with *The Heritage Resources Act*.

Manitoba Hydro's CEPP and the drafts of other plans are included in tendering documents for projects such as the MMTP. This way, contractors know when they are preparing bids what kind of environmental protection work is expected of them. Contractors are responsible to have a dedicated environmental officer on site, responsible for training, implementing mitigation measures and adhering to the CEPP. Stop-work orders can be issued to prevent damage to the environment or cultural and heritage resources and financial penalties are in place for non-compliance with these protection plans.

As well as these plans, Manitoba Hydro commits to develop an Operations and Maintenance Environmental Protection Plan, which will specify ongoing access management and monitoring requirements, and a Decommissioning Environmental Protection Plan, which will be completed at the end of the project's operational life.

12.3 Management Plans

A series of management plans will be developed by Manitoba Hydro or the contractor (subject to Manitoba Hydro's approval) prior to construction of the project. They will address management issues, regulatory requirements and corporate commitments and describe the actions to prevent or mitigate effects and mechanisms for evaluating and reporting these actions and results. In addition to stipulating specific actions, each of the plans will include regular inspections by Manitoba Hydro's environmental inspectors.

12.3.1 Access Management Plan

This plan is intended to address concerns about the potential for access to the project for construction to have adverse effects on wildlife, wetlands, waterways, habitat, agriculture, resource use, and heritage and cultural resources. It will address subjects such as timing of access, cleaning of vehicles (to prevent the spread of weeds), gate protocols, load restrictions, warning signs, speed limits, avoidance of sensitive areas, stream crossings and safety. Manitoba Hydro has also committed to develop an Operations and Maintenance Access Management Plan, which will consist of a mapbook identifying any specific access restrictions for workers involved in the operations and maintenance phase of the project, as well as any access management mitigation measures.

What We Heard – Access Management Plan

Access management was a concern for many of the private landowners who appeared at the hearings in La Broquerie or sent written submissions to the commission. These presenters were concerned that the clearing of the ROW would make it easier for trespassers to access their land either on foot or on off-road vehicles. Concerns were expressed about safety, environmental damage and biosecurity as a result of such trespassing. One presenter spoke of growing up in the area of the project with the assumption that transmission line ROWs were public lands available for off-road vehicle travel. Many people will make the same assumption about the MMTP, it was suggested, even where the ROW traverses private land. This presenter was concerned that fences and gates meant to eliminate unauthorized travel on private land would be ineffective, and showed photographs of missing or damaged gates and fences on other transmission lines.

Another presenter expressed the concern that the project would affect Indigenous land and resource use by increasing access to areas in the southern and eastern portions of the project area. A traditional land and resource use survey of Metis resource harvesters found that harvesters typically encounter two to four people while hunting or gathering in the area from Anola to the U.S. border. While hunting or gathering closer to Winnipeg, in the area from the Dorsey Converter Station to Anola, they encounter more than 10 other people. It was feared that an increase in access in the less-travelled areas could reduce success rates for harvesters as well as alter the experience.

Commission Comment – Access Management Plan

The panel shares the concern that increased public access resulting from the project has the potential for negative effects on the natural and socio-economic environment, especially those associated with all-terrain vehicles and snowmobiles. Unwanted public access can result in new trails and water crossings that may lead to trampling and destruction of plants and nests, harassment of wildlife, increased erosion and sedimentation, increased harvesting pressure, loss of riparian habitat, legal and illegal harvest of plant and animal resources, degradation and destruction of sensitive ecological and cultural sites, increased litter, spreading of invasive species, risks to biosecurity and nuisance effects on landowners. The negative effects from increased access could lead to more significant effects than those predicted in the EIS. This type of environmental effect is sometimes referred to as a “nibbling” effect, in which there is a gradual loss or degradation of the environment or resources over a long period of time.

The Access Management Plan prepared by Manitoba Hydro dealt only with the construction phase of the project. Access management during the operations and maintenance phase has not yet been finalized. The EIS states that this plan will include an access route mapbook that identifies any specific access restrictions and/or access management mitigation measures. Manitoba Hydro has stated that experience gained during the construction stage of the project will inform access management during operations and maintenance.

The panel believes that the close proximity of the MMTP to Winnipeg makes this right-of-way (ROW) more susceptible to a damaging increase in access than would be the case for a more remote transmission line. Throughout the hearing, the panel heard concerns about the limited natural areas remaining in

southern Manitoba and the ever-increasing pressure on the remaining natural resources.

Controlling Access onto Private Land

During the hearing process, the panel members asked Manitoba Hydro how it can prevent undesired access on the ROW. The panel understands that in more recent projects, such as Bipole III, Manitoba Hydro has put in place agreements with landowners with respect to access management. The panel believes that it is important for all landowners to understand that access controls are an option that can be included in an agreement with Manitoba Hydro. Manitoba Hydro must inform all landowners whose property is crossed by the line that these options exist and that the cost of these access controls will be borne by Manitoba Hydro.

Controlling Access on Crown Land

Regarding access management on Crown land, Manitoba Hydro has indicated that its staff members work with staff from Manitoba Sustainable Development on access management and controls. The department should be an active participant in identifying and working with Manitoba Hydro on access-management concerns, including identifying high-priority areas that may require controls such as fences, gates, signs, berms or other physical impediments or the removal of previously created roads and trails. Manitoba Hydro should develop creative and flexible approaches to prevent increases in ATV and snowmobile access, which in places will involve managing vegetation on the ROW so that off-road vehicles cannot easily travel on it. An example of this could be applying larger vegetated buffers to the small streams crossed by the ROW in order to create a greater impediment to travel. The panel believes that an access management plan for the operation stage of the project should be prepared and used as the mechanism to identify access

controls and mechanisms, including the identification of key access-control points. This plan should be submitted to Manitoba Sustainable Development for approval. This plan should be updated officially every five years based on monitoring, which is further discussed later.

In order to ensure that the ROW does not lead to the further degradation of adjacent lands, Manitoba Sustainable Development should not consider transmission lines on Crown land as locations for new vehicular recreational trails, without consideration of effects on wildlife, vegetation, wetlands and waterways and other valued components of the environment.

Access Monitoring

Based on evidence presented during the hearings, the panel believes that Manitoba Hydro and the government have the legal tools to maintain access controls. However, the panel is concerned that the best intentions may erode slowly over time and the nibbling effect may go unchecked. The panel believes it is important that these access controls be regularly monitored. Given that Manitoba Hydro currently conducts yearly inspections of its transmission line ROWs, the inspection of the MMTP could include an assessment of the effectiveness of access controls and of the creation of new paths or damage to vegetation and wetlands resulting from new access. This will involve co-operation between Manitoba Hydro and Manitoba Sustainable Development to determine how to evaluate access controls and how to train Manitoba Hydro's inspectors to determine causes and effects of increased access. Evaluating the effectiveness of access controls and evidence of damage caused by increased access could also be a task for the multiparty monitoring group that will be discussed later in this chapter.

12.3.2 Blasting (Splicing) Plans

Blasting plans will be prepared by the contractor to manage the storage and use of explosives at construction sites for the project. During the stringing of the conductor wires, explosives are used inside a protective sleeve to splice lengths of conductor together. Each blast creates a sound that has been compared to a shotgun blast. Because the conductor wires come in spools of 3,200 metres, blasting will be required every 3.2 km to create a splice. Communication related to blasting, such as notifying area residents and resource users when blasting will occur, will be included within the plan for project communications.

12.3.3 Emergency Preparedness and Response Plans

These plans will be developed by each contractor in order to prepare for any emergency situations that may arise. They will include any spills or releases of hazardous materials, such as petroleum products, accidents involving hazardous substances, medical emergencies, explosions and fires.

12.3.4 Erosion Protection and Sediment Control Plans

Manitoba Hydro's framework for erosion protection and sediment control will guide contractors in developing these plans. These plans will establish measures to prevent erosion and control sediment, such as establishing buffer zones around waterways, carrying out construction in certain areas while the ground is frozen and avoiding sensitive areas.

12.3.5 Rehabilitation and Invasive Species Management Plan

A draft of this plan was submitted as a supplemental filing to the EIS. The draft plan outlines steps such as washing equipment and vehicles prior to entering the construction site, controlling vegetation at construction sites and restoring and re-vegetating sites in need of rehabilitation. Sites may require rehabilitation to reduce the risk of erosion, control the spread of invasive plants, reduce access, reclaim land (including land affected by soil compaction), improve aesthetics or restore ecosystem function. The draft plan lists several of the most common invasive species, such as leafy spurge, purple loosestrife and Canada thistle, and steps to control them. It outlines Manitoba Hydro's responsibility to control invasive species on the land it owns, as well as its commitment to work with private landowners or the provincial government in cases where Manitoba Hydro's activities have introduced invasive species to private or Crown land. Several appendices are attached to the draft plan, including a checklist form to be used in invasive species management, a statement on Manitoba Hydro's biosecurity protocol, a list of general strategies for sites requiring large-scale rehabilitation, lists of native seed mixes and native plants available for use in rehabilitation and a list of species listed by the Invasive Species Council of Manitoba.

12.3.6 Waste and Recycling Management Plans

These plans will be developed by contractors, guided by Manitoba Hydro's framework on waste and recycling management, to manage waste at work sites and camp locations. Measures will prescribe proper storage of kitchen waste, recycling and disposal of construction waste and disposal of waste in licensed facilities.

12.3.7 Integrated Vegetation Management Plan

Manitoba Hydro's Integrated Vegetation Management Plan has five goals:

- provide access and maintain the integrity of the transmission system against outages from vegetation;
- maintain public safety by reducing fire risk;
- respect traditional land uses and practices;
- encourage a stable, low-growing plant community; and,
- minimize environmental effects of vegetation management activities.

Manitoba Hydro achieves these goals through the selective control of vegetation, targeting the taller forms of vegetation; consideration of the adjacent environmental and land-use values; and through various methods of vegetation treatment. Four different categories of vegetation management are employed: manual cutting (e.g., chainsaw, brush saw); mechanical cutting (e.g., feller buncher or shear blading); chemical (herbicide application); and cultural (e.g., pasture management). All four of these methods would likely be used on the MMTP. Manitoba Hydro also uses GPS technology to geo-reference areas requiring treatment and environmentally sensitive sites in order to ensure accurate application of vegetation-control products.

Data supplied by Manitoba Hydro suggest that it is reducing its herbicide use over time on an area basis. The quantity of herbicide required for a specific ROW will be slowly reduced as taller vegetation is selectively eliminated and a lower-height plant community becomes established.

Manitoba Hydro will develop an Integrated Vegetation Management Plan that prescribes methods of vegetation control, including application of herbicides, environmental protection measures associated with herbicides, communication and criteria for the use of various vegetation-control methods. Vegetation management typically requires winter clearing to prevent tall growth that could create the risk of a power outage. This clearing is often carried out using a tracked vehicle with a cutting blade known as a K-G blade. In sensitive areas it is carried out with hand tools or with feller bunchers, which have a long arm capable of reaching into a sensitive area to cut trees. The goal of vegetation management is to ensure that the ROW regenerates with grasses, flowering plants and low shrubs, which can prevent the growth of trees by eliminating the sunlight needed by seedlings.

Herbicides may be applied to prevent tree regeneration or infestation by weeds. As well, herbicide may be applied directly to the stump of a tree that has been cut down to prevent it from putting up shoots. For trees such as aspens that produce large numbers of suckers, non-chemical means of vegetation management can result in more suckers coming up, requiring repeated clearing.

From 2003 to 2016, Manitoba Hydro treated an average of 1,500 to 1,800 hectares per year to prevent tree growth on ROWs. Herbicide use for weed control varies from year to year but has averaged about 1,000 hectares per year since 2013. This is a relatively small portion of the approximately 64,000 hectares of distribution line ROW and 50,500 hectares of transmission line ROW in Manitoba. Although there is some variation in the amount of herbicide used, most years it has been about two kilograms per hectare. However, Manitoba Hydro stated that a new formulation that went into use in 2016 allows for application at a rate of one kilogram per hectare.

What We Heard – Integrated Vegetation Management Plan

Several participants and presenters expressed concern about the plan for vegetation management. One participant asked if Manitoba Hydro conducts safety tests on the ingredients used in herbicides. Manitoba Hydro responded that such testing is the responsibility of Health Canada, and all herbicides used by the corporation are applied by trained and licensed staff in accordance with Health Canada standards and instructions on the product label. Concerns were expressed both by landowners who didn't want herbicides applied on their property and by representatives of First Nations who were concerned about the effect of herbicides on the environment. It was stated that the use of herbicides in the ROW would discourage First Nations and Metis resource users from gathering medicinal plants, berries and other plants. Landowners with gardens near the ROW were also concerned about herbicide-use plans. Asked specifically what would happen if a private landowner insisted that Manitoba Hydro not use herbicides, a representative of Manitoba Hydro said the corporation would attempt to explain the rationale and methods for herbicide use (including the regulatory requirement to ensure that tall vegetation cannot come in contact with the line). If the landowner cannot be persuaded, Manitoba Hydro would comply with a no-herbicides request. The corporation was then asked if it would take a similar approach if First Nations or Metis resource users wanted a no-herbicides approach on all Crown land. Manitoba Hydro said it would not be able to take such an approach, in part because of the cost of frequent non-chemical clearing and in part because of the previously described problem of trees producing suckers following mechanical vegetation management.

Commission Comment – Integrated Vegetation Management Plan

The panel and most, if not all, of the participants at the hearing recognized that the management of vegetation within the ROW is required for the safe and secure operation of the transmission line. The panel acknowledges that a number of methods may be required to accomplish vegetation management goals and that Manitoba Hydro's plan has evolved and developed with experimentation and experience over many years. The panel supports Manitoba Hydro's use of adaptive management to refine its vegetation management approach.

The panel also accepts that chemical treatment needs to remain a tool in the vegetation-management toolkit, albeit one that should be used only with great care. The panel was assured that Manitoba Hydro's practices comply with the instructions on the label of the product used, as approved by Health Canada. The panel notes that cost and safety are not the only reasons to continue to use herbicides, as other methods may have greater environmental impacts. For instance, using purely mechanical and manual methods would likely require more regular clearing. This would lead to greater greenhouse gas emissions, the destruction of ground-based nests and increased disturbance of wildlife. The key is to ensure the right methods are being applied in the right locations with the minimum volumes of herbicide applied to achieve acceptable control.

In order to gain and maintain the confidence of communities in its vegetation-management activities, Manitoba Hydro must share information about these activities. Many presenters expressed the concern that they would not be informed about locations and timing of vegetation management, especially

herbicide use. Manitoba Hydro must develop a communication protocol for informing the public about these activities, using the project website, the proposed monitoring committee and other communication methods. This protocol must be part of the comprehensive communication plan for the MMTP recommended in Chapter Six.

One unique aspect of the MMTP is that in some segments of the ROW, vegetation will be managed in less traditional ways, protecting and encouraging certain types of plant communities. Manitoba Hydro identified that a large area of the ROW will be managed at a more intermediate level of growth (i.e. shrubs and low-level vegetation) in order to provide habitat for a species at risk, the threatened golden-winged warbler. This could be a model for the way vegetation is managed in natural areas, particularly on Crown land, to assist other wildlife species through habitat management.

The panel also heard that if First Nations and the MMF identify areas of important plant resources or cultural sites of significance these areas can be protected from mechanical or chemical management. The panel is aware that these sites may not yet have been identified, but Manitoba Hydro has indicated flexibility on dealing with these sites. The panel believes it is critically important that sites of significance are protected from activities that may damage such resources. The panel is aware that this cannot mean most of the ROW is not cleared, but rather some balance needs to be achieved. The panel believes that the monitoring committee identified later in this report can assist in striking a balance.

Opportunities may exist for other parties, such as academic researchers or non-governmental organizations (NGOs), to carry out research on alternative vegetation management practices along the ROW.

The panel was made aware of the Green Lane Research and Demonstration Area in Montgomery County, Pennsylvania, which was initiated in 1986 at the request of the Philadelphia Electric Company (Yahner and Hutnik, 2005). This long-term project consists of two zones along a 500 kV transmission line ROW, which are used to monitor the long-term effects on plant species richness, invasive species and wildlife of various herbicide and mechanical vegetation management approaches. Manitoba Hydro and participants in the hearing should consider long-term studies of different vegetation-control methods using academic researchers or in cooperation with First Nations, Metis or organizations such as conservation districts.

A number of the participants in the hearing indicated concerns with the loss of natural habitat associated with the transmission line. While the panel concurs that the actual loss of natural habitat in the MMTP is relatively small, the panel is also aware that natural areas have been dwindling in southern Manitoba. Therefore, the panel believes Manitoba Hydro should continue to pursue ways of making the ROW as natural as possible, assuming it doesn't compromise safety and is compatible with adjacent land uses. The edge of the ROW would then be less straight and abrupt, which would therefore have both aesthetic and ecological benefits. Modern GPS and GIS technologies make this a simpler exercise than in the past. The panel understands that in some parts of Europe, ROWs are managed with more attention to such ancillary social and ecological benefits (Amprion, 2016). The panel is not suggesting that the MMTP needs to be as highly managed as some transmission lines in Europe where manual control methods are used, but the panel urges Manitoba Hydro to consider the ROW as a natural resource that produces multiple societal benefits and is not simply a space for the transmission line.

Overall, the panel believes that Manitoba Hydro is on the right track with respect to vegetation management. However, in view of the length of time required for new vegetation to fully establish itself, it is recommended that the proposed monitoring committee and Manitoba Sustainable Development undertake reviews of the integrated vegetation-management practices along the ROW five and 10 years after completion of construction.

What We Heard – Environmental Protection Program

In addition to discussion of specific aspects of the Environmental Protection Program, such as the Access Management Plan and Integrated Vegetation Management Plan, the panel heard critiques of the overall philosophy and management approach for environmental protection.

The panel heard a discussion of the concept of active adaptive management and the need to be prepared for uncertainty. Active adaptive management is an approach that not only prepares to adapt to differing environmental conditions, but involves experiments intended to determine the environmental conditions or indicate the best means of preventing or mitigating environmental effects. Manitoba Hydro's plan to develop golden-winged warbler habitat in parts of the transmission line ROW was considered an example of active adaptive management and a sign that the corporation has taken steps to adopt this philosophy.

However, a participant stated that achieving best practices in environmental management will still require additional steps, including being prepared to respond to uncertainty and planning for uncertainty. Development of an organizational learning

policy would be a step toward preparing for uncertainty and would also ensure continuity in the corporation, so that lessons learned on past projects and on the MMTP would be shared throughout the organization, rather than potentially being lost should current employees leave. This participant expressed the concern that Manitoba Hydro's plan to eliminate positions in the corporation could increase uncertainty and affect institutional memory if workers with knowledge important to the project and environmental protection are among those who leave.

Some participants noted that several of the management plans that are components of the overall EPP were not yet written. In many of these cases, Manitoba Hydro has a framework document providing general description of the purpose of the plan, but the plan itself will be developed by the contractor prior to the start of construction. It was argued that not having the plans finalized at the time of the EIS, or the hearings, reduces transparency and creates uncertainty. Manitoba Hydro replied that because the various components of the project are different from one another, contractors need to develop plans appropriate for the part of the project they are responsible for. The objectives of these contractor-developed plans, as well as expected components, are described in the framework documents Manitoba Hydro has prepared to guide contractors in developing plans.

Commission Comment – Environmental Protection Program

While vegetation management was the plan that received the most attention during hearings, discussions of the need for biosecurity suggest that there would also be public interest in the Rehabilitation and Invasive Species Management Plan. As well,

questions were directed during the hearing about blasting, which for this project will only be carried out to splice together lengths of transmission line. Given the interest expressed in this project and the value of transparency, Manitoba Hydro should make all these plans – including those that are developed by the contractor – publicly available.

12.4 Environmental Monitoring Plan

Manitoba Hydro's Environmental Monitoring Plan lays out monitoring activities that will be carried out to determine effects on the valued components (VCs) identified in the EIS. The monitoring plan indicates a schedule of surveys and studies that will be carried out in the Project Development Area (PDA), the Local Assessment Area (LAA) or the Regional Assessment Area (RAA) during and after construction, in some cases continuing for five years. The purposes of monitoring include confirming the nature of predicted environment effects, assessing effectiveness of mitigation, identifying effects that require action, identifying unexpected effects, identifying additional mitigation measures and providing baseline information for monitoring long-term changes. Monitoring is required under both the *Canadian Environmental Assessment Act (2012)* and the *National Energy Board Act*

Specific monitoring activities identified in the plan, grouped according to VC, are:

- stream-crossing assessment (fish and fish habitat);
- wetland surveys, rare plant surveys, invasive plant surveys, traditional-use plant surveys (vegetation and wetlands);
- wetland amphibian survey, snake hibernacula survey, bird-wire collision survey, sharp-tailed grouse lek survey,

bird species of conservation concern survey, golden-winged warbler habitat survey, raptor nest survey, camera trap surveys, winter aerial surveys for ungulates and predators, vehicle collision statistic gathering, mineral lick survey (wildlife and wildlife habitat);

- project employment reporting, direct and indirect business opportunities reporting, direct labour income and taxes reporting (employment and economy);
- traffic monitoring survey (infrastructure and services); and
- black bear bait site camera trap survey (land and resource use).

For each of the aspects of the physical or socio-economic environment to be monitored, the plan lays out roles and responsibilities for workers involved. Two categories of workers involved are environmental monitors and specialists. Environmental monitors may be Manitoba Hydro staff members, consultants hired by Manitoba Hydro, Indigenous community members selected by a proposed Indigenous Community Monitoring Working Group or university students at the bachelor's or master's level. Typically, environmental monitors will record observations on site and provide a first-hand view of the project area, while specialists will provide expertise to review observations, plan information gathering, analyze results and recommend actions. Specialists may be Manitoba Hydro staff or consultants hired by Manitoba Hydro. They will also work with Manitoba Hydro's environmental inspectors, who are Manitoba Hydro staff members who monitor mitigation measures and inspect the work of contractors to ensure that environmental requirements are followed.

The monitoring plan lays out details regarding how specific studies will be carried out, such as the size and distribution of plots

to be studied during vegetation surveys, the timing and techniques to be used to survey amphibian populations and the timing and techniques for aerial surveys.

Reports on monitoring will be prepared annually and delivered to Manitoba Sustainable Development and the National Energy Board. As well, Manitoba Hydro will discuss monitoring results with First Nations, the MMF and Indigenous organizations as requested.

Monitoring of construction indicates when and where work on the project has not complied with mitigation requirements. For example, Manitoba Hydro presented information, in response to an information request, on instances of non-compliance with the mitigation measures for stream crossings during construction of the Bipole III Transmission Project. During Bipole III construction, instances were observed of minor rutting, minor bank damage and slash left “below the tree line” (high water line). Monitoring revealed the need to take corrective action in these incidents and in other areas, such as the installation of more bear-proof containers for waste.

In addition to environmental monitoring of projects such as Bipole III and the MMTP, Manitoba Hydro is audited through the ISO 14001 process. ISO 14001 audits have indicated two deficiencies in storage of hazardous material (lack of secondary containment) as well as 22 releases of hazardous materials at the Riel Converter Station.

As part of its draft monitoring plan, Manitoba Hydro has proposed a continuation of the FNMEP during the construction, operations and monitoring phase of the project. This approach is based in part on a desire stated in ATK and traditional land and resource use reports for Indigenous

communities to remain involved during the monitoring of the project, to work on mapping of sensitive sites and to transfer knowledge from elders to youth. The corporation envisions participation in Indigenous monitoring field trips providing an opportunity to witness and learn about mitigation measures, the project schedule, clearing and construction practices, and inspection and monitoring results. During follow-up and monitoring field trips, participants could be involved in activities such as surveys of vegetation, traditional-use plants, stream crossings, mammal tracks, birds and camera traps.

Manitoba Hydro has continued to discuss these opportunities since submitting the EIS and proposes a continued program of field trips to the site in which representatives of First Nations and the MMF could meet with environmental inspectors, specialists and other staff, ask questions and participate in monitoring activities. Initial field trips were held prior to the hearings and these led to discussions of an Indigenous Monitoring Working Group, details of which Manitoba Hydro expects to develop with the involved First Nations and the MMF.

What We Heard – Environmental Monitoring Plan

A variety of thoughts on strengthening monitoring were presented during the hearings. One participant urged that Manitoba Hydro not be able to monitor itself – that such monitoring be by an independent third party. Another participant said a monitoring body, such as the Indigenous Monitoring Working Group, needs to have power to require actions.

It was argued that third-party oversight would add to the transparency of Manitoba

Hydro's environmental management programs and build trust between the corporation and the community. The panel heard discussions of the difference between the external audits carried out as part of Manitoba Hydro's ISO 14001 program and a public external audit. The ISO 14001 audits are largely focused on the corporation's system of adhering to its own environmental policies and on its adherence to regulatory requirements. The participant argued that a higher standard of monitoring would go beyond basic regulatory requirements. As well, ISO 14001 audits are typically not released in public, as they are considered the intellectual property of the auditor. For the MMTP EIS, Manitoba Hydro obtained permission from the auditor to release some material from past audits.

For this reason, the participant recommended that Manitoba Hydro be required to commission a third-party independent environmental audit of the MMTP that would look at the effectiveness of its Environmental Protection Program and the various plans that contribute to it. Manitoba Hydro responded to this recommendation by pointing out that the corporation will soon be audited for its Bipole III project. A more efficient use of resources, the corporation argued, would be to wait to see if the Bipole III audit determines any shortcomings in the EPP. If it does, instead of ordering a general environmental audit of the entire MMTP, an audit of those areas identified in the Bipole III report would be appropriate.

Noting that the Clean Environment Commission had recommended a third-party audit for Bipole III, this participant recommended that two of the commission's other recommendations from the Bipole III report should be repeated for the MMTP. These are that Manitoba Hydro provide an annual report to the Manitoba government providing information that can be used to determine the accuracy of predictions about

effects and mitigation and that Manitoba Hydro maintain a website on the MMTP for the life of the project containing easily retrievable information that is updated frequently.

The time frame for monitoring was also a concern. One participant noted that, except for monitoring of sharp-tailed grouse leks, most of the monitoring identified in the EIS ends two years after completion of construction. This short time frame does not provide enough time for all post-construction effects to be seen or for new conditions to become fully established before the end of monitoring. As a result, this approach leads to greater uncertainty regarding the prediction of the significance of project effects. Another participant specifically recommended that monitoring of wildlife and wildlife habitat be extended to at least five years and called for extension of the monitoring of traditional medicines as well. Additional monitoring plans were recommended as well for three aquatic species of conservation concern: bigmouth buffalo, mapleleaf mussel and lake sturgeon.

Commission Comment – Environmental Monitoring Plan

Attached to its closing statement at the hearings, Manitoba Hydro presented an appendix containing 277 undertakings related to the construction and operation of the MMTP. Many of these undertakings mitigate environmental impacts as broadly defined under *The Environment Act*. While Manitoba Hydro is accountable for fulfilling all these undertakings, many must be completed by contractors. The panel noted, for example, that many of the contractors during the construction period must develop Environmental Protection Plans related to

their activities. These plans are informed by Manitoba Hydro's guidelines and are assessed and approved by Manitoba Hydro during the contractor selection process. Manitoba Hydro also uses frequent site inspections during the project to ensure that contractors are following these plans. Such oversight is appropriate for complex projects, which, by their nature, rely on the work of contractors. In the course of a project like the MMTP there may be temptations to take shortcuts when cost or scheduling pressures build. Additional diligence in monitoring is prudent in these situations to ensure that environmental protection and mitigation is carried out, lessons are learned that can be applied in future projects and trust is built in communities concerned about the project.

Monitoring occurs in two stages: during construction and after construction. Manitoba Hydro provides examples of monitoring that will be carried on during construction and for a few years post-construction. In Manitoba Hydro's approach as discussed in the EIS and hearings, monitoring builds on the engagement activities that began in the route-selection process. Manitoba Hydro presented the proposed Indigenous Monitoring Working Group as building on the interest demonstrated through field trips for interested Indigenous communities that were carried out as part of the FNMEP. Given that some surveys conducted for the EIS were not yet complete at the time of the hearings, formalization of a community monitoring group provides an opportunity both to complete these surveys and to involve interested communities in this process.

Four surveys were not completed prior to the hearings: sites with high potential for archaeological resources, rare plants, invasive plants and traditional-use plants. These surveys will need to be completed prior to construction. As well, the panel noted previously that surveys for eastern tiger salamander, least bittern, short-

eared owl and mottled duskywing are needed. These topics, in particular, will require a greater monitoring effort because of the potential uncertainty resulting from the incomplete knowledge in the EIS. The monitoring committee proposed to oversee environmental effects of the project should be involved in discussions on how to protect sensitive sites identified through these surveys.

Community involvement in monitoring was largely discussed in terms of the Indigenous Monitoring Working Group, although there was discussion of the continuation of the PEP and landowner communications during the construction and post-construction periods. Manitoba Hydro stated that the system of landowner liaisons would continue, so that each landowner whose property is crossed or bordered by the project will have a regular point of contact.

Given that Manitoba Hydro will continue to be engaged with both Indigenous and non-Indigenous communities during the construction and operation phases of the project, it would help to build understanding of all the environmental issues involved if there were a multi-party monitoring advisory group involving both Indigenous and non-Indigenous people. There could be sub-groups within this group, such as the proposed elders and grandmothers committees discussed by some participants. Some members of this advisory group may wish to form a subcommittee such as the currently proposed Indigenous Monitoring Working Group to carry out some of the activities Manitoba Hydro proposed for this group. This subcommittee would also still organize or receive reports from activities such as the Indigenous field trips proposed by Manitoba Hydro. However, maintaining an umbrella monitoring advisory group with other representation, including landowners, rural municipalities or conservation districts, would help with sharing understandings.

The panel heard elders, resource users and representatives of First Nations and the MMF speak of the ancient and vital relationship of Indigenous people with the land and water. The panel also heard from local landowners who spoke of the importance of the wildlife, forests and wetlands in their community and from farmers who spoke of their commitment to conserving the soil and water. Protecting the land and water is a value shared by Indigenous and non-Indigenous people, and one that could find expression through this umbrella monitoring advisory group.

The panel therefore envisions a monitoring advisory group with a diversity of outlooks and experience. This group should review Manitoba Hydro's implementation of its commitments and undertakings and compliance with licence conditions and recommendations, and should also inform First Nations, the MMF, municipalities, landowners, and the government about monitoring activities and results through regular, periodic reporting. A major role for this monitoring group would be to review the results of Manitoba Hydro's monitoring and inspection program at the completion of post-construction monitoring in 2021-2022 and to determine if timelines for monitoring specific VCs need to be extended further and if any additional mitigation measures are required.

The panel will not be prescriptive about the structure, composition, priorities and work plan of the monitoring advisory group, but believes that some foundational principles can be stated. The MMTP monitoring advisory group should:

- contain diverse representation from key stakeholders affected by the project, including the Indigenous community and landowners;
- provide advice and recommendations to Manitoba Sustainable Development,

Manitoba Hydro, First Nations, the MMF, local governments and other authorities as appropriate;

- focus closely on Manitoba Hydro's compliance with licence conditions and its project commitments related directly to the MMTP;
- have full access to all inspection, incident and progress reports related to licence conditions and Manitoba Hydro project commitments; and
- fairly compensate members for their time and expenses.

Although such an advisory committee would develop its own priorities, it may, for example:

- participate in compliance-verification activities during construction by accompanying Manitoba Hydro and Sustainable Development inspectors;
- meet with government and with Manitoba Hydro and its contractors as needed;
- review maintenance and ROW-restoration activity reports;
- be involved in biological surveys;
- provide perspectives on compliance-process improvements; and
- issue a report on its assessment of monitoring results and Manitoba Hydro's communication and engagement activities regarding the MMTP.

All the above activities would be funded by Manitoba Hydro and appear as budget line items for the MMTP.

The monitoring advisory group should be made up of nominees of affected First

Nations and the MMF, beginning with nominations from communities that have thus far participated in the planning and environmental review of the project, and representatives of landowners, municipalities, academic institutions and (NGOs), such as conservation groups and the Consumers' Association of Canada. It is essential to recruit group members who can offer informed, practical perspectives on matters related to licence conditions and Manitoba Hydro undertakings. The panel believes that participation on the monitoring advisory group would be a part-time responsibility with perhaps a more intensive schedule of activities over the first year or two and thereafter a more strategic calendar of activities during the operation phase.

The panel is aware that many of the participants and presenters who were involved in the hearing process consider monitoring to a potential guarantee of environmental protection, if done well, or Achilles' heel, if not done well. A well-designed and adequately funded monitoring program provides confidence for Manitobans with an interest in the biophysical and socio-economic environment of the project area.

The panel heard from participants who expressed the opinion that a monitoring group should be independent. The panel agrees that, while Manitoba Hydro may be responsible for carrying out monitoring activities (by staff or consultants), a monitoring advisory body must have independence to comment and advise. Public trust is also enhanced by regular and prompt public release of monitoring reports.

In this same vein, independent, third-party auditing uses a systematic process of information gathering and benchmarking to provide an additional level of environmental protection. Audits may help to determine weaknesses in policies or missing steps in procedures. They may also help to indicate

trends, both positive and negative. In the Clean Environment Commission's Bipole III report, the commission recommended that one audit be carried out after the completion of construction and a second audit be carried out five years later. This recommendation was made a condition of Manitoba Hydro's licence. The panel believes that findings from the first of these audits may contain valuable lessons for the MMTP and for other Manitoba Hydro transmission projects. Periodic, independent audits of construction and operation of transmission lines might offer valuable lessons for Manitoba Hydro and for Manitoba Sustainable Development. Having said that, the panel is open to the suggestion that the department consider the need for audits, based on the results of monitoring and input from the proposed monitoring advisory group.

As well, the panel encourages Manitoba Hydro to seek the agreement of its auditors to release results of ISO 14001 audits in order that the monitoring advisory group and the public gain a better understanding of Manitoba Hydro's environmental performance. This will also allow the department to make a more informed decision about the need for any third-party audits.

Regarding the concerns about the limited time frame of monitoring, the panel agrees that many effects will take longer than two years to be fully recognized. As mentioned previously, if the project increases access for ATVs and snowmobiles and other users, the results of this increased traffic may gradually become visible over time. By the time these effects are fully visible, the damage may already be done. It will also take some time to determine if the proposed golden-winged warbler habitat is fully effective. The ROW will be, for all intents and purposes, a permanent feature of the region, so it makes sense to monitor its effects for a long enough period of time to be able to conclude with some confidence what its long-term effects will be.

In this context, the panel again notes the Green Lane Research and Demonstration Project (Yahner and Hutnik, 2005). Given its relative proximity to Manitoba's main research institutions, the MMTP would provide an opportunity to involve both scientists and the community in research to assess the long-term results of different vegetation management approaches in Manitoba's climate and forest types. Given the number of transmission lines Manitoba Hydro manages across the province, and likely future growth in the transmission network, this knowledge could have province-wide benefits.

Licensing Recommendations

The commission recommends that:

- | | |
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| <p>12.1 Manitoba Hydro inform all landowners whose property is crossed by the ROW that access controls can be implemented at Manitoba Hydro's expense.</p> <p>12.2 Manitoba Hydro prepare an access management plan for the operational stage of the project, identifying the key access-control points and various mechanisms to be employed in controlling unwanted access. The plan is to be submitted to Manitoba Sustainable Development for approval and reviewed every five years.</p> <p>12.3 Manitoba Hydro, in carrying out its annual inspections of the ROW, also inspect and report on the effectiveness of access controls to Manitoba Sustainable Development. Where access controls are not effective, Manitoba Hydro work with either the private landowners or the department to remedy the situation.</p> | <p>12.4 Manitoba Hydro submit to Manitoba Sustainable Development a review of integrated vegetation-management practices for the ROW on an annual basis for the first 10 years of operations and as determined by the department after 10 years.</p> <p>12.5 Manitoba Hydro make contractor environmental plans public.</p> <p>12.6 Manitoba Hydro establish and support a monitoring advisory group composed of nominees of First Nations communities and the Manitoba Metis Federation and representatives of local residents, interested non-governmental organizations and academic researchers, which will provide input into monitoring and management of the ROW.</p> <p>12.7 Manitoba Hydro maintain a website, updated frequently, for the life of the project, where monitoring reports, monitoring advisory committee minutes and reports and other material relevant to the project will be posted.</p> <p>12.8 Manitoba Hydro provide to Manitoba Sustainable Development annual monitoring reports, for a period of at least 10 years and thereafter as determined by the department, containing information in such detail that past, current and future assessments can be made as to the accuracy of predictions, success of mitigation actions and commitments to future actions.</p> |
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Non-Licensing Recommendations

The commission recommends that:

- 12.9 The Manitoba government not consider transmission lines on Crown land as locations for new recreational trails, without consideration of impacts on the environment and other established uses.

- 12.10 Manitoba Hydro promote the use of the ROW for research into different methods of vegetation management, inviting landowners, the Manitoba government, Indigenous communities, academic researchers and non-governmental organizations to participate.

- 12.11 Manitoba Sustainable Development determine, based on available monitoring information and monitoring advisory committee and public feedback, whether a third-party audit is required at project completion and after five years of operation.

Chapter Thirteen

Going Forward

13.1 Engagement

As noted in the foreword, the terms of reference for the review of this project were specifically updated, prior to the hearings, to ensure that the commission considered the effect on First Nations, Metis and other Aboriginal communities of any changes to the environment. The panel took this direction very seriously, particularly in this time of reconciliation.

Recent national commitments, reports and court decisions strengthening the requirement for consultation and engagement of Indigenous communities in resource development all form a backdrop to the Manitoba-Minnesota Transmission Project hearings and report. Recognizing that this is an evolving relationship, the commission is satisfied that Indigenous peoples were actively involved in the MMTP hearings and that their views have been reflected in Manitoba Hydro's work. The panel has recommended that Manitoba Hydro formally add a route planning principle guiding the corporation to "avoid or limit the effects on areas of interest to Indigenous people" and it fully expects that this will become a normal part of project planning, especially for resource-related projects.

The views of the general public, landowners and consumers were also given

serious attention by Manitoba Hydro and by the commission. It is stressed that earlier inclusion will lead to better understanding between the proponent and all parties and among the parties themselves. Opportunities to participate throughout the life cycle of a project, including early planning, construction and ongoing operation, should be available. Such comprehensive engagement should be part of the planning process, at least for all major resource-related projects. Manitoba Hydro could lead the way for others in showing how to successfully engage with the diverse communities that are affected by energy projects.

To assist in providing a consistent approach, it would be advisable if the Manitoba and federal governments collaborated closely in developing practical guidelines to assist proponents in engaging the public, including Indigenous communities, in all stages of projects, including the planning of the development and the ongoing monitoring of construction and operation.

13.2 Sustainable Development Planning

MMTP's 121 kilometres of new right-of-way (ROW) are proposed to run through a mosaic landscape of forest and wetlands, residential and agricultural lands. This

landscape, which provides some unique and critical wildlife habitat, has been used by Indigenous people for millennia, and by farmers, loggers and others who have worked hard to make a living from land that is less productive than in some other regions. There has been a significant loss of forested lands (and by extension probably wetlands) and a marked increase in fragmentation due to the development of agriculture, residential developments and roads in the study area since 1930. More recently, parts of the area have experienced an intensification of livestock operations and significant numbers of rural residential developments that provide homes to many who work in the cities but enjoy living in more rural surroundings. Much of the Crown land has been set aside for forestry, wildlife, recreation, protection of natural features and other designations. This corner of the province contains some of the last vestiges of formerly common habitats and species as identified by the environmental impact statement and by First Nations and the Manitoba Metis Federation. A large high-quality aquifer lies below the Sandilands Provincial Forest and surrounding area, which provides potable water to the region. The ecosystem is important to the health of the area and of the province and may be particularly important in the context of international commitments to reach targets for protected areas.

Manitoba Hydro states that within the 30-kilometre wide strip of land that makes up the Regional Assessment Area, 0.3 per cent of habitat will be altered by clearing of the ROW and construction of the project. This small amount however, is a measure of what is lost from that remaining in southeast Manitoba. At a project level, the effects may be viewed as insignificant, as Manitoba Hydro concluded. Going forward, from a regional historical perspective, the cumulative effects of development on these remaining natural areas may be more significant.

Some arguments were provided to the panel that Manitoba Hydro developments should be moved onto “sparsely populated land” (Crown land), in part so that “natural” habitats could remain on private property. These arguments are perfectly understandable from the perspective of people who work hard to build an agricultural operation or a home in a rural setting which they want to protect. At the same time, to simply move development further into the “sparsely populated” lands would accelerate the fragmentation. The Final Preferred Route represents a trade-off between differing viewpoints.

Land-use decisions, like those faced by Manitoba Hydro on this project, are not easily made in such a diverse environment. The decision process is complex and is first and foremost a planning exercise which requires more regional, longer-term societal guidance so that the choices don't have to be made on a case-by-case basis.

Almost 20 years ago, The Consultation on Sustainable Development Initiative (COSDI, 1999) recommended large-area sustainable development planning to guide local plans, developments and environmental assessments. This planning would ideally be eco-system based, balance the economic, social and environmental needs of an area and include an environmental sustainability assessment such as the one considered by the panel in this report. The planning process should involve all interested parties, including local residents and users, First Nations and the Metis, the province, municipalities, conservation organizations and others. Such planning would provide more clarity on interests, constraints and opportunities to enable better decisions to be made. In today's world, this planning could guide the activities of the province, First Nations, the Metis community, municipalities and landowners.

Such an initiative in the complex landscape of southeastern Manitoba would

be very helpful to entities such as Manitoba Hydro in undertaking development in the area, especially if the planning initiative produced principles and policies to guide those developments. This planning should incorporate an ecosystem approach that encompasses past and present uses, as well as the cultural importance and all the benefits of the landscape. Special attention should be made to protect wetlands. Initiatives to repair fragmentation, through reforestation or natural regeneration, should be considered.

In the project before us, Manitoba Hydro convened a panel to assign values and weight the importance of features on the landscape. In an ideal world, consideration for utility corridors, and policies to guide their location, would be addressed prior to their development, thereby minimizing the requirement for the proponent to undertake extensive field research in areas that would have already been identified with significant constraints or as inappropriate for development. Large-area sustainable development planning would take into consideration the attributes and importance of agricultural, forested and natural lands and wetlands with a view to finding the appropriate balance.

As part of a planning exercise, the impact of fragmentation and degradation of the landscape, especially wetlands, needs to be evaluated based upon the impacts on the ecological functions of the watershed and of the aquifer. The commission has made some recommendations regarding management of the right-of-way for this transmission line to try to minimize the effects of further fragmentation and to create habitat for vulnerable species.

Fragmented natural areas occur on private lands as well. The discretion for preserving and managing the natural environment on private lands lies with the landowner, and many devote considerable energy to doing

that. Some landowners who presented information to the commission take pride in conserving natural areas on their properties. Individual landowners should be encouraged to preserve and enhance habitats on their lands and perhaps facilitate the reconnection of fragmented patches with those of their neighbours. Protection of natural areas on private lands is an important contribution to habitat conservation and watershed management. Assistance with vegetation and wetland management on private lands can be sought from conservation organizations. Easements and alternative land-use service agreements could be used to help protect these properties in the long term. Commensurate with the extent of the transmission line's impacts on natural habitat, contributions from Manitoba Hydro to managing natural lands and wetlands on private lands, especially in the project area, would be appropriate.

A particular planning issue that was raised in relation to this project and to other rights-of-way or linear trails was the potential environmental damage that can result from recreational vehicle traffic as well as conflict with residents and other traditional users of the landscape. We heard that the need for access controls and especially the effective management of off-road vehicles needs serious attention on Crown lands and on rights-of-way over private lands. Although it is the commission's understanding that efforts regarding the designation and maintenance of snowmobile trails have made progress in recent years, in future, assessment of the impacts of these trails on the natural and social environment must also be taken into consideration as part of land-use planning and linear project assessments. It is worth noting that a large part of the Crown land in question is designated as Provincial Forest and it is the commission's understanding that the province has the authority, subject to other legislation, to manage roads and thus access within the forest.

13.3 Environmental Review Process

The commission would like to reiterate that the provincial assessment process could use some enhancements and, as has been stated in previous reports, more transparency and better communication about the process.

This particular environmental assessment provided greater public input and more comprehensive information and logical flow of materials than those provided previously by Manitoba Hydro. The commission encourages the department to require this same quality of assessment for all major projects. The province should encourage proponents to prepare scoping documents that mirror the quality of the one for this project.

Developing clear and consistent standards and processes for major projects should be a co-operative effort shared, to the extent possible, by the federal and provincial governments collaborating with interested parties. These co-operative standards and processes should be comprehensive as well as reflect the principles and guidelines of sustainable development and similar federal guidance, while avoiding duplication, reducing complexity for major project proponents and stakeholders, and managing costs.

One other licensing issue, expressed by more than one participant, was the murkiness of how a licence amendment is undertaken and approved, at least from their perspectives. They wanted to know who approves amendments and what opportunities exist for public input. Although alterations are posted on the registry, it is not always clear how the alteration was approved. Flexibility and the ability to react over time to changing realities are important features of a licensing process. However, the current alteration process requires clarification for the public and needs to be as transparent as possible.

The commission appreciates the opportunity to conduct this review and believes that its recommendations and its suggestions for going forward will prove useful to the province, the proponent and the other participants.

Chapter Fourteen

Recommendations

Licensing Recommendations

The commission recommends that:

- | | | |
|-----|--|--|
| 2.1 | A Class 3 <i>Environment Act</i> licence be issued to Manitoba Hydro for the Manitoba-Minnesota Transmission Project, subject to licensing conditions outlined in subsequent recommendations in this report. | with input from Indigenous and local knowledge holders, prior to construction, to include areas within the Local Assessment Area on Crown and private land that were not sampled or that were insufficiently sampled in preparation for the EIS. An example would be the area affected by the change to the Piney border crossing. |
| 6.1 | Manitoba Hydro complete a communication plan for the MMTP and submit it to Manitoba Sustainable Development, describing how it will communicate information about project activities, such as commencement and completion of construction, clearing, blasting and vegetation management, to individuals and communities with an interest in the project. | 9.1 Manitoba Hydro include participation of Indigenous and local knowledge holders in heritage resource surveys. |
| 8.1 | Manitoba Hydro conduct field surveys of the eastern tiger salamander and mottled duskywing butterfly, in areas of likely habitat, prior to construction. | 9.3 Manitoba Hydro offer to landowners to plant shrubs or trees in order to replace shelterbelts removed by the project. |
| 8.2 | Manitoba Hydro expand point-count and breeding bird surveys, to include the least bittern and the short-eared owl, prior to construction. | 9.4 Manitoba Hydro offer to residents to plant shrubs or trees in order to screen the view of the project from residences in close proximity to the ROW. |
| 8.5 | Manitoba Hydro expand traditional-use and invasive-plant surveys, | 11.1 Manitoba Hydro include criteria regarding GHG emissions throughout the supply chain in its selection process for suppliers and contractors for the Manitoba-Minnesota Transmission Project. |
| | | 12.1 Manitoba Hydro inform all landowners whose property is crossed by the ROW that access controls can be implemented at Manitoba Hydro's expense. |

- 12.2 Manitoba Hydro prepare an access management plan for the operational stage of the project, identifying the key access-control points and various mechanisms to be employed in controlling unwanted access. The plan is to be submitted to Manitoba Sustainable Development for approval and reviewed every five years.
- 12.3 Manitoba Hydro, in carrying out its annual inspections of the ROW, also inspect and report on the effectiveness of access controls to Manitoba Sustainable Development. Where access controls are not effective, Manitoba Hydro work with either the private landowners or the department to remedy the situation.
- 12.4 Manitoba Hydro submit to Manitoba Sustainable Development a review of integrated vegetation-management practices for the ROW on an annual basis for the first 10 years of operations and as determined by the department after 10 years.
- 12.5 Manitoba Hydro make contractor environmental plans public.
- 12.6 Manitoba Hydro establish and support a monitoring advisory group composed of nominees of First Nations communities and the Manitoba Metis Federation and representatives of local residents, interested non-governmental organizations and academic researchers, which will provide input into monitoring and management of the ROW.
- 12.7 Manitoba Hydro maintain a website, updated frequently, for the life of the project, where monitoring reports, monitoring advisory committee minutes and reports and other material relevant to the project will be posted.

- 12.8 Manitoba Hydro provide to Manitoba Sustainable Development annual monitoring reports, for a period of at least 10 years and thereafter as determined by the department, containing information in such detail that past, current and future assessments can be made as to the accuracy of predictions, success of mitigation actions and commitments to future actions.

Non-Licensing Recommendations

The commission recommends that:

- 6.2 Manitoba Hydro take steps, in future projects, to facilitate Aboriginal traditional knowledge and land and resource use studies being completed in time to be incorporated into the environmental impact statement.
- 6.3 Manitoba Hydro, for future projects, provide a communication plan describing how it will communicate project activities, such as commencement and completion of construction, clearing, blasting, and vegetation management, to communities and individuals with an interest in the project area. This plan should be submitted as part of the EIS.
- 6.4 The Manitoba government explore with First Nations and the Manitoba Metis Federation the development of a database that could provide the government and potential developers early advice and guidance regarding ATK and traditional land uses in a project area.

7.1	Manitoba Hydro, in its future transmission line route-selection processes, involve Indigenous representatives and community, landowner and consumer representatives in early engagement sessions used to develop evaluation models and define route-planning areas, alternative corridors and routes, as well as to identify baseline studies.		opportunity for Indigenous employment and skills development and a respectful workplace.
7.2	Manitoba Hydro take into account the full range of natural values and traditional uses of Crown land and private land in route selection.	9.5	Manitoba Hydro, in future projects, also consider the visual impact of a transmission line on traditional land and resource use.
7.3	Manitoba Hydro add an eighth route-siting principle designed to avoid or limit effects on areas of interest to Indigenous communities.	10.2	Manitoba Hydro, in future environmental impact statements, include a more complete discussion of project cumulative effects that brings together materials for all VCs and the project area.
7.4	Manitoba Hydro use consistent terminology and descriptions to make its future route-selection processes easier for non-specialists to understand.	12.9	The Manitoba government not consider transmission lines on Crown land as locations for new recreational trails, without consideration of impacts on the environment and other established uses.
7.5	Manitoba Hydro incorporate a re-assessment process into future applications of the EPRI-GTC methodology so that eliminated route options can be reconsidered if there is a significant change in a fundamental parameter, such as the border crossing location in this instance.	12.10	Manitoba Hydro promote the use of the ROW for research into different methods of vegetation management, inviting landowners, the Manitoba government, Indigenous communities, academic researchers and non-governmental organizations to participate.
8.3	Manitoba Hydro continue to develop methods for enhancing habitat along transmission line ROWs.	12.11	Manitoba Sustainable Development determine, based on available monitoring information and monitoring advisory committee and public feedback, whether a third-party audit is required at project completion and after five years of operation.
8.4	Manitoba Hydro support reforestation or other habitat development projects within the Project Study Area.		
9.2	Manitoba Hydro, over the course of the MMTP, continue to improve its processes to provide greater		

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Appendix I

Terms of Reference



MINISTER OF
SUSTAINABLE DEVELOPMENT

Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

FEB 15 2017

Mr. Serge Scrafield
Chair
Clean Environment Commission
305 – 155 Carlton Street
Winnipeg MB R3C 3H8

Dear Mr. Scrafield:

A handwritten signature in cursive script, appearing to read "Serge".

Re: Manitoba Hydro - Manitoba-Minnesota Transmission Project

On December 31, 2015 the Department of Sustainable Development issued Terms of Reference to the Clean Environment Commission for public hearings on the proposed Manitoba-Minnesota Transmission Project (MMTP).

The Terms of Reference have been revised to ensure the scope of the hearings will meet federal environmental assessment requirements related to the potential impacts of the project on Aboriginal people, and avoid duplication of the provincial and federal environmental assessment processes. The revised Terms of Reference are attached.

Yours sincerely,

A handwritten signature in cursive script, appearing to read "Cathy Cox".

Cathy Cox
Minister

Enclosure

c: Tracey Braun

**Revised Terms of Reference
Clean Environment Commission
Manitoba-Minnesota Transmission Project (the Project)**

Background

On November 21, 2014, Manitoba Hydro filed an Environment Act Proposal (EAP) for the Manitoba-Minnesota Transmission Project with the Environmental Approvals Branch (EAB) of Conservation and Water Stewardship. In addition to the EAP, Manitoba Hydro provided a draft scoping document that outlined their proposed scope for an Environmental Impact Statement (EIS) for the project. The scoping document was subjected to a Technical Advisory Committee (TAC) and public review. The scoping document was finalized based on the comments received in this review and was submitted on June 10, 2015. Subsequently, the EIS was submitted on September 22, 2015.

As authorized under *The Environment Act*, the Minister of Sustainable Development has decided that the assessment of the Manitoba-Minnesota Transmission Project will include a review by the Clean Environment Commission (the Commission).

Terms of Reference

Pursuant to Section 6 (5.1) of *The Environment Act*, the Minister has determined that the Terms of Reference the Commission is to follow are:

- To review the EIS, including the proponent's public consultation summary. Note that a detailed technical review will be completed by provincial agencies who are members of the TAC. Federal specialists will also be invited to provide comments on the project as part of the TAC review. Documents produced during this assessment should be considered by the Commission as input for the hearings;
- To hold public hearings for the Commission to consider stakeholder and public input; and
- To prepare and file a report with the Minister of Sustainable Development outlining the results of the Commission's review and providing recommendations for the Minister's consideration. The report should be filed within ninety (90) days from the date of completion of hearings as per Section 7(3) of *The Environment Act*.

Mandate of the Hearings

The Commission shall conduct the hearings in general accordance with its Process Guidelines Respecting Public Hearings.

The Commission may, at any time, request that the Minister of Sustainable Development review or clarify these Terms of Reference.

Hearings should be located in areas that will allow reasonable access to potential stakeholders, including in the project area and Winnipeg.

The Commission shall, within the mandate of the hearing and the Terms of Reference provided by the Minister as noted above, provide a report recommending:

- Whether an Environment Act licence should be issued to Manitoba Hydro for the Manitoba-Minnesota Transmission Project, and
- Should the Commission recommend issuance of a licence, any conditions that should be included in the licence.

The Commission's recommendation shall incorporate, where appropriate, the Principles of Sustainable Development and Guidelines for Sustainable Development as contained in *Sustainable Development Strategy for Manitoba*.

The review by the Commission of the EIS and the public hearings will include consideration of the effect on First Nations, Metis and other Aboriginal communities of any changes to the environment including those related to: (i) health and socio-economic conditions, (ii) physical and cultural heritage, (iii) the current use of lands and resources for traditional purposes, and (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Manitoba will provide an opportunity for First Nations, Metis and other Aboriginal communities to advise of any concerns about potential adverse effects of the project on the exercise of Aboriginal or treaty rights through a Crown-Aboriginal Consultation process. While the eventual licensing decision pursuant to *The Environment Act* will consider the results of the consultation process, Crown-Aboriginal consultation is a distinct process from the public review process, including hearings to be conducted by the Commission. As such, the Commission is not being called on to conduct a Crown-Aboriginal consultation process or to consider the appropriateness or adequacy of the consultation process for the project. The Commission also need not assess whether identified impacts may constitute an effect on the exercise of Aboriginal or treaty rights.

October 21, 2016

Appendix II

Individuals Involved in the Hearings

<i>Name</i>	<i>Affiliation</i>
Abraham, William	Little Black River First Nation
Adkins, Robert	Manitoba Hydro
Amundson, Butch	Manitoba Hydro
Bailey, William	Manitoba Hydro
Bédard, Albert	Private
Bédard, Monique	Private
Beddome, James	Southern Chiefs Organization
Bedford, Doug	Manitoba Hydro
Berrien, Bob	Southeast Stakeholders Coalition
Blacksmith, Craig	Dakota Plains Wahpeton Oyate
Block, David	Manitoba Hydro
Blonski, Scott	Private
Bluesky, Gord	Brokenhead Ojibway Nation
Bohlken, Frank	Manitoba Hydro
Bouchard, Hubert	Private
Bratland, Maggie	Manitoba Hydro
Braun, Tracey	Manitoba Sustainable Development
Campbell, Tracy	Manitoba Metis Federation
Carrier, Jerry	Private
Cizek, Petr	Southern Chiefs Organization
Coughlin, Sarah	Manitoba Hydro
Daniels, Jerry	Grand Chief, Southern Chiefs Organization
Daniels, Dave	Long Plain First Nation
Daniels, Ernie	Long Plain First Nation

<i>Name</i>	<i>Affiliation</i>
Davis, Zachary	Manitoba Metis Federation
Dawson, David	Private
De Carlo, Nick	Manitoba Hydro
De Jong, Peter	Private
Fehr, Andreas	Private
Fitzpatrick, Patricia	Consumers' Association of Canada
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Appendix III

Acronyms

AC	Alternating Current
ATK	Aboriginal Traditional Knowledge
DC	Direct Current
EIS	Environmental Impact Statement
EMF	Electrical and Magnetic Frequency
FNMEP	First Nations and Metis Engagement Program
kV	Kilovolt
LAA	Local Assessment Area
MMF	Manitoba Metis Federation
MW	Megawatt
NGO	Non-Governmental Organization
PDA	Project Development Area
PEP	Public Engagement Process
RAA	Regional Assessment Area
ROW	Right of Way
RPA	Route Planning Area
TLE	Treaty Land Entitlement

