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Proposed Morris Natural Gas Pipeline Project – Environmental Review and Assessment

Submitted to:

Manitoba Hydro

Licensing & Environmental Assessment Department

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EXECUTIVE SUMMARY

Manitoba Hydro is proposing to install a new 4 inch (") steel natural gas pipeline near Provincial Road (PR) 201 located about 4 kilometers (km) west of Letellier, Manitoba. The Project will provide additional natural gas capacity to meet increased usage and community growth, as well as provide reliable service to existing customers in the area.

The Project will be located between the communities of Letellier, Manitoba and St. Jean-Baptiste, Manitoba in the RM of Montcalm. The proposed new 4" steel natural gas pipeline will run in a south to north direction parallel to an existing 3" steel natural gas pipeline. The proposed works also include the installation of a new above grade valve assembly south of PR 201, and the removal of a 2" above grade valve assembly and a 3" above grade valve assembly located about 1 km southwest of St. Jean-Baptiste, Manitoba. Manitoba Hydro will also be seeking to acquire an additional easement of 15 m to provide the Right-of-Way (RoW) area needed to install and operate the new 4" steel natural gas pipeline. The total length of the proposed pipeline is approximately 14.5 km. The Project is defined as the works required to: install and operate the new natural gas pipeline; install the new above grade valve assembly; and remove the 2" and 3" above grade valve assemblies. The Project will be considered a Class 2 Development and requires a license under the Manitoba *Environment Act*.

The pipeline will be installed using trenching techniques in non-sensitive areas and directional drilling at all road crossings and environmentally sensitive areas. The existing 2" and 3" above grade valve assemblies, the northern most portion of the new 4" steel natural gas pipeline to be installed and a portion of the new RoW are located in proximity to the Plum River. There are no instream works or watercourse crossings required as part of the Project; therefore, no effects to waterways are anticipated.

Construction/installation of the proposed new 4" pipeline and 4" above grade valve assembly and removal of the existing 2" and 3" above grade valve assemblies are proposed to take place between mid-June, 2013 and mid-August, 2013, with site restoration and clean up proposed to occur between the middle to end of August 2013.

The Project will be located on private lands and will traverse government road allowances. The Project study area was defined as the areas located within 1 km of either side of the proposed new pipeline route and valve assembly locations. The Project study area consists of farmsteads and cultivated lands; the substation and a number of turbines for the St. Joseph Wind Farm; and the Miller Environmental Corporation Waste Treatment and Processing Facility. Other infrastructure located within the Project study area includes municipal and provincial roads, RoWs and drainage ditches; and a hydroelectric transmission line that runs parallel to PTH 75 and crosses the Project area.

The areas that will be affected by the Project consist of flat, cultivated fields, road allowances and drainage ditches that are regularly disturbed by activities related to agriculture, road maintenance, drainage ditch maintenance and wind turbine operation. Trees and vegetation within the Project area are limited to shelterbelts and farmsteads. There were no wetland areas observed to be present in the Project area. The Plum River and its tributaries flow through the

northern part of the Project area. There were no heritage resources identified in the Project area; the closest known heritage resources sites are seven Centennial farms that are located along the length of the Project area at a distance of 0.7 km to 2 km from the west side of the Project study area. There were no Protected Areas or Wildlife Management Areas located within or adjacent to the Project study area. There were no First Nation communities found to be located within the Project area; the closest First Nation community is the Roseau River Anishinabe First Nation, located on the east side of PTH75 about 3 km to 5 km from the Project study area. Based on the agreement made between the Manitoba Métis Federation and the Province of Manitoba in September 2012, the Project area lies within Métis Natural Resource Harvesting Zone 33.

The potential environmental effects will be minimized through the use of mitigation measures, adherence to the Manitoba Hydro Environmental Protection Plan (EPP) for the Project and compliance with applicable municipal, provincial and federal environmental regulations, guidelines and/or policies. Potential environmental effects identified for the Project include: a temporary increase in dust and noise; disturbance or alteration of small areas of previously disturbed soils or vegetation; temporary disturbance to wildlife, land use, resource use and area residents during construction activities; and potential effects on groundwater, soils or vegetation due to accidental spills during construction activities. The assessment found that construction activities within the Project area could also temporarily disturb any species at risk that could be present in the area. Based on the type of habitat present within the Project area (i.e., cultivated fields and road allowances) and the habitat requirements of the species at risk that could be in the area, the potential for the Project to have an effect on species at risk in the Project area is considered to be minimal and not significant.

The Public Engagement Program conducted for the Project indicated that there was support for the Project by the local municipality, landowners and the general public in the Project area. Manitoba Hydro contacted Peguis First Nation, Roseau River Anishinabe First Nation and the Manitoba Métis Federation to notify these groups of the Project and solicit any comments, questions or concerns. The landbase within the Project area consists of private lands that are used mainly for agriculture. Therefore, it is anticipated that traditional resource activities (e.g., hunting, trapping, fishing, gathering of plants) would be lower in this area of private lands than on Crown lands, and traditional resource activities would be limited. Manitoba Hydro met with a Roseau River Anishinabe First Nation representative to discuss the Project. Manitoba Hydro will work with Roseau River Anishinabe First Nation to coordinate a meeting with their Custom Council (a group of representatives from families within the community) and other community members. Manitoba Hydro continues to endeavour to meet with the Peguis First Nation and Manitoba Métis Federation to discuss this Project, as well as other projects being undertaken by Manitoba Hydro.

The residual effects associated with the Project were found to be minimal or low. As such, the environmental effects of the Project are expected to be not significant. The environmental assessment found that residual effects are expected to occur for the following environmental components: air quality and Greenhouse Gases (GHGs); noise; terrain, soils and vegetation; wildlife and wildlife habitat; groundwater; species at risk; land use and resource use.

The residual effects of the Project are not expected to significantly interact with the environmental effects of past, present or reasonably foreseeable future projects or activities within the vicinity of the Project study area. Therefore, there were no cumulative effects identified for the proposed Project.

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- Appendix F: Morris Natural Gas Pipeline – Public Engagement Program

1. INTRODUCTION

Manitoba Hydro is proposing to install a new 4 inch (") steel natural gas pipeline near Provincial Road (PR) 201 located about 4 kilometers (km) west of Letellier, Manitoba. The proposed new 4" steel natural gas pipeline will run in a south to north direction parallel to an existing 3" steel natural gas pipeline. The proposed works also include the installation of a new above grade valve assembly south of PR 201, and the removal of a 2" above grade valve assembly and a 3" above grade valve assembly located about 1 km southwest of St. Jean-Baptiste, Manitoba. The total length of the proposed pipeline is approximately 14.5 km. The Project is defined as the works required to: install and operate the new natural gas pipeline; install the new above grade valve assembly; and remove the 2" and 3" above grade valve assemblies.

The Project will be considered a Class 2 Development and require licensing under the Manitoba *Environment Act*. This report was prepared to provide the environmental information required by the Province of Manitoba to issue an Environment Act License for the Project.

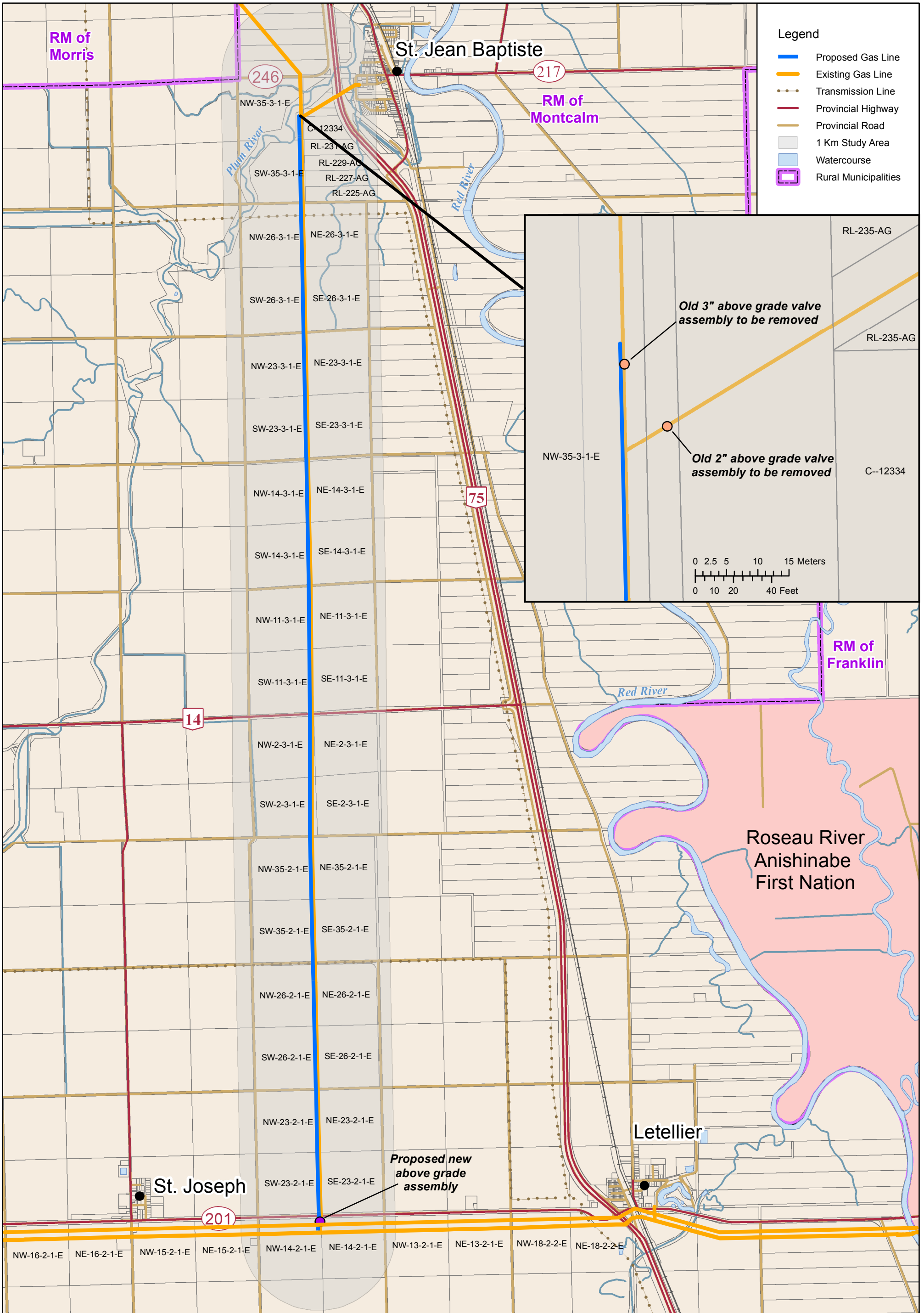
2. PROJECT AREA AND LOCATION

The Project will be located between the communities of Letellier, Manitoba and St. Jean-Baptiste, Manitoba in the Rural Municipality (RM) of Montcalm. Figure 1 shows the:

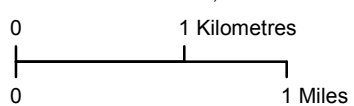
- Project study area;
- location of the existing 3" steel natural gas pipeline that runs south to north;
- location of the existing 4" steel natural gas pipelines that run east to west;
- selected route for the proposed new 4" steel natural gas pipeline;
- proposed location for the new above grade assembly; and
- location of the 2" and 3" above grade valve assemblies to be removed.

The new 4" natural gas pipeline will begin in NW14-2-1 E, proceed north through SW23-2-1 E, NW23-2-1 E, SW26-2-1 E, NW26-2-1 E, SW35-2-1 E, NW35-2-1 E, SW2-3-1 E, NW2-3-1 E, SW11-3-1 E, NW11-3-1 E, SW14-3-1 E, NW14-3-1 E, SW23-3-1 E, NW23-3-1 E, SW26-3-1 E, NW26-3-1 E, SW35-3-1 E and terminate in NW35-3-1 E. The new above grade valve assembly will be located in NW14-2-1 E on the south side of PR 201. The existing above grade assemblies to be removed are located in NW35-3-1E and in a road allowance adjacent to NW35-3-1 E.

The Project activities will take place on private lands and government road allowances. The Project study area was defined as the areas located within 1 km of either side of the proposed new pipeline route and valve assembly locations (Figure 1).



Coordinate System: UTM Zone 14N NAD83
 Data Source: MB Hydro, ProvMB, NRCAN
 Date Created: March 5, 2013



1:45,000

Morris Pipeline Project

Proposed Pipeline Route

Draft: For Discussion Purposes Only

3. PROJECT DESCRIPTION

3.1. Overview

As noted above, the Project includes the installation of a new 4" steel natural gas pipeline from PR 201 located about 4 kilometers (km) west of Letellier, Manitoba, north to an existing 3" line located about 1 km southwest of St. Jean-Baptiste, Manitoba. The proposed new 4" steel natural gas pipeline will run in a south to north direction parallel to an existing 3" steel natural gas pipeline. The proposed new 4" steel natural gas pipeline will tie-in to existing steel natural gas pipelines at two locations: to an existing 3" line located about 1 km southwest of St. Jean-Baptiste, Manitoba, and to an existing 4" line located about 0.2 km south of PR 201 that runs in an east to west direction (Figure 1). The proposed works also include the installation of a new 4" above grade valve assembly on the south side of PR 201, and the removal of a 2" above grade valve assembly and a 3" above grade valve assembly located about 1 km southwest of St. Jean-Baptiste, Manitoba. The total area required for the new 4" above grade assembly to be located south of PR 201 is about 8 m x 8 m, as per Manitoba Hydro Standard 531.02. The total length of the proposed pipeline is approximately 14.5 km.

Manitoba Hydro has an existing easement that is 10.05 m wide for the existing 3" steel natural gas pipeline. As part of the Project, Manitoba Hydro will be seeking to acquire an additional easement of 15 m to provide the area needed to install and operate the new 4" steel natural gas pipeline. The new 25.05 m wide RoW would extend from the location of the new 4" above grade valve assembly south of PR 201 to a location about 0.2 km north of PR 246.

The pipeline will be installed using trenching techniques in non-sensitive areas and directional drilling at all road crossings and environmentally sensitive areas. The existing 2" and 3" above grade valve assemblies, the northern most portion of the new 4" steel natural gas pipeline to be installed and a portion of the new RoW are located in proximity to the Plum River (Figure 1). However, there are no instream works or watercourse crossings required as part of the Project.

The set of drawings attached as Appendix A to this report provide additional information on the location of the existing and proposed new pipeline, pipeline RoW and above grade valve assemblies; the proposed pipeline route; the bill of materials; and the construction and installation methods that will be used for the Project. The information is provided in a series of views that follow the selected route for the proposed pipeline. The following drawings are included in Appendix A:

- Pipeline Drawings:
 - Drawing CD-16961 – Sheet 1 – provides the location and route for the proposed pipeline; information on project contacts; the sequence of procedures to be used to install and energize the new 4" and 3" pipelines; a flow schematic that shows the layout and locations of the works; a plan view and cross-section of the pipeline installation at road crossings; and the bill of materials.

- Drawing CD-16961 – Sheet 2 – provides Views 1 and 2 of the proposed pipeline installation; the existing and proposed new pipeline RoW; insets with detailed information on the pipeline connections and valve assemblies; and the bill of materials.
- Drawing CD-16961 – Sheet 3 – provides Views 3, 4 and 5 of the proposed pipeline installation; the existing and proposed new pipeline RoW; and the bill of materials to be used for the pipeline installation.
- Drawing CD-16961 – Sheet 4 – provides Views 6, 7 and 8 of the proposed pipeline installation; the existing and proposed new pipeline RoW; and the bill of materials to be used for the pipeline installation.
- Drawing CD-16961 – Sheet 5 – provides Views 9, 10 and 11 of the proposed pipeline installation; the existing and proposed new pipeline RoW; and the bill of materials to be used for the pipeline installation.
- Drawing CD-16961 – Sheet 6 – provides Views 12, 13 and 14 of the proposed pipeline installation; the existing and proposed new pipeline RoW; and the bill of materials to be used for the pipeline installation.
- Drawing CD-16961 – Sheet 7 – provides Views 15 and 16 of the proposed pipeline installation; the existing and proposed new pipeline RoW; and the bill of materials to be used for the pipeline installation.
- Water Control Works Drain Crossing Drawing:
 - Drawing CR-133139 – provides details of the Water Control Works drain crossing at Road 11NE.
- Above Grade Valve Assembly Drawings:
 - 1-C2101-DB-92100-0001 C001 00 - Cover Sheet
 - 1-C2101-DB-91135-0001 0001 00 - 3” Control Point Valve Abandonment Details
 - 1-C2101-DB-92100-0001 0001 00 - 3” & 4” Control Point Valve Location Details
 - 1-C2101-DB-92110-0001 0001 00 - 3” & 4” Control Point Fabrication Details
 - 1-C2101-DB-91121-0001 0001 00 - Excavation and Compaction Details
 - 1-C2101-DB-91121-0001 0002 00 - Excavation and Compaction Details

3.2. Work Activities and Work Sequence

The Project will include the following work activities that will be carried out in the following sequence:

- 1) Project Planning and Design – This phase of the Project includes conducting and submitting the environmental assessment; communicating with all affected stakeholders (i.e., landowners, RM of Montcalm, Manitoba Infrastructure and Transportation [MIT], Manitoba Conservation and Water Stewardship [MCWS]); preparing the site plan and design drawings; obtaining required approvals, permits and/or licenses; and obtaining landowner permissions and land easements, where required.

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- 2) Tender – Prepare contract, bid period, award and mobilize for construction. Conduct pre-tender meetings with the Contractor to review the work, safety, environmental requirements and concerns, land owner concerns, and any other pertinent information.
 - 3) Mobilization – The Contractor mobilizes to the Project site, obtains all utility locations and permits required to start the work activities.
 - 4) Site Preparation – The RoW, pipeline alignment and areas for the new valves and above grade valve assemblies will be surveyed and staked out to ensure that the pipeline, valves and above grade valve assemblies are installed as designed.
 - 5) Construction/Installation – the construction or installation phase of the Project includes the following activities:
 - a) New 4” Pipeline:
 - i) Topsoil Removal: On agricultural land the topsoil will be pushed to the side of the RoW to prevent mixing of the topsoil with the subsoils and to minimize soil compaction. The topsoil will be removed to a maximum depth of 305 mm (12 inches).
 - ii) Pipe Welding: The pipes will be welded together in accordance with CSA Z662 (latest version) and all welds will be non-destructively examined to ensure the highest integrity weld is produced.
 - iii) Trenching: The pipe will be installed in a trench approximately 460 to 915 mm (18 to 36 inches) wide. The trench is dug using track-hoes or a large trenching machine.
 - iv) Directional Drilling: All road crossings and environmentally sensitive areas will be crossed using directional drilling.
 - v) Lowering and Tie-Ins: The majority of the pipeline will be welded above grade and lowered into place. In instances where two long sections of pipeline are tied together a larger excavation will be made to allow the welder to access the pipeline below grade.
 - vi) Pressure Testing: Prior to putting the pipeline into service, the line will be pressure tested with water to confirm the strength of the pipeline (i.e., hydrostatic testing) and to ensure that there are no leaks. The water required for hydrostatic testing (about 300 cubic metres [m³]) will be obtained from the RM of Montcalm water supply. Hydrostatic testing, including the release of the water used for testing, will be conducted as per the Project EPP and Manitoba Water Stewardship (MWS) guidelines and permitting for hydrostatic testing (MWS 2007).
 - b) New 4” Above Grade Valve Assembly:
 - i) The sequence of procedures to install and operate the new 4” above grade valve assembly south of PR 201 is described on Sheet 1 of Drawing CD-16961.
 - ii) As described on Drawing 1-C2101-DB-92100-0001 0001 00, the area for the new 4” above grade valve assembly is divided into three types of construction zones: Zone 1 is the area requiring materials for the site foundation; Zone 2 is the area
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requiring materials for the below grade piping compaction with granular backfill without insulation; and Zone 3 is the area requiring materials for the below grade piping compaction with native backfill without insulation. The area required for the new 4" above grade assembly is about 8 m x 8 m, as per Manitoba Hydro Standard 531.02.

- iii) As described in the "Excavation and Site Foundation Notes" on Drawing 1-C2101-DB-92100-0001 0001 00 and illustrated in Detail A, B and C of Drawing 1-C2101-DB-92100-0001 0002 00, the construction of the area for the new 4" above grade valve assembly will include: removal of 10" (25.4 cm) of top soil and organic material within the areas of Zones 1, 2 and 3; for Zone 1, the site foundation construction and driveway instructions found in Detail A; for Zone 2, compaction below pipe with granular backfill instructions found in Detail B; for Zone 3, compaction below pipe with native backfill instructions found in Detail C; all finished compacted areas to conform to 98% standard proctor tests; all new vertical pipe risers to be rock wrapped along below grade portions prior to backfilling; all exposed and new pipe to be surrounded with 6" of sand prior to backfilling; and the backfill material will consist of $\frac{3}{4}$ " down crushed limestone and will be free of organic material, large rocks and stones.
- 6) Removal of Existing Above Grade Valve Assemblies:
 - a) The sequence of procedures to remove the 2" and 3" above grade valve assemblies located about 1 km southwest of St. Jean Baptiste is described on Sheet 1 of Drawing CD-16961 and illustrated on Drawing 1-C2101-DB-91135-0001 0001 00.
 - 7) Site Restoration and Clean-up: After the new 4" pipeline and new 4" above grade valve assembly are installed and the existing 2" and 3" above grade valve assemblies are removed, the topsoil will be re-spread, construction debris will be removed, and the land will be leveled to allow regular land use to resume. Any areas of cultivated lands within or adjacent to the RoW will be seeded by landowners as part of their normal agricultural operations; any other areas of exposed soils that arise as a result of the Project activities will be seeded with an approved seed mix. A Manitoba Hydro Onsite Representative will respond to complaints and provide contact information.
 - 8) Operation and Maintenance – The Operations and Maintenance (O&M) phase of the Project will include the following activities for the new 4" pipeline and new 4" above grade valve assembly:
 - a) New 4" Pipeline:
 - i) Yearly leak survey of the 4" steel pipeline.
 - b) New 4" Above Grade Valve Assembly:
 - i) Yearly maintenance, which includes checking for leaks and equipment maintenance (greasing of valves, replacing regulator springs, lighting replacements etc.).
 - ii) Snow-clearing of the site, as necessary.

- iii) Supervisory Control And Data Acquisition (SCADA) monitoring at the site will identify any emergency situations occurring on the pipeline such as a damage to the pipeline. SCADA monitoring will trigger alarms at specific low pressure settings (monitored in real-time) and the appropriate personnel will be notified to respond and rectify the situation.
- 9) Decommissioning – The new 4” pipeline and new 4” above grade valve assembly are expected to be in service indefinitely and will be maintained on a regular basis to extend the service period and ensure safe and efficient delivery of natural gas to area customers. As such, there are no current plans for decommissioning the new 4” pipeline or new 4” above grade valve assembly.

3.3. Work Areas, Site Access and Construction Equipment

As shown in Figure 1, the works will take place along existing provincial and municipal roads, ditches, access roads and trails located within the Project area. The total length of the pipeline is about 14.5 km and the total area required for the new 4” above grade valve assembly is about 8 m by 8 m. As noted above, all road crossings and environmentally sensitive areas will be crossed using directional drilling. The remainder of the piping will be placed using an open trench method, which will be about 0.5 m to 1 m wide. All pipeline construction/installation activities will take place within the existing RoW and/or in small areas of private land eased from the landowners. The new 4” above grade valve assembly will be located in the northern part of NW-14-2-1-E on the south side of PR 201. The pipeline route and new 4” above grade valve assembly location will be surveyed and staked out prior to construction/installation. The area staked out for the Project will include the land easements obtained from affected landowners. Work areas will be accessed using the existing roads and access trails. The construction equipment that will be used includes: ½ to 1 ton truck, backhoe, bulldozer, Directional Drill, front end loader, sideboom, tandem/trailer, trackhoe, trencher, vacuum truck and a welding rig. During operations and maintenance activities, a ½ ton truck and/or four-wheeled All Terrain Vehicle (ATV or “quad”) would be used to access and service the pipeline, valves and/or above grade valve assembly.

4. PROJECT SCHEDULE

Construction/installation of the proposed new 4” pipeline and 4” above grade valve assembly and removal of the existing 2” and 3” above grade valve assemblies are proposed to take place between mid-June, 2013 and mid-August, 2013, with site restoration and clean up proposed to occur between the mid to latter part of August 2013. O&M activities will commence after completion of site restoration and clean up.

5. BACKGROUND AND NEED FOR THE PROJECT

The purpose of the Project is to provide additional natural gas capacity in the RM of Montcalm and Morris area to meet increased natural gas usage and community growth from both

residential and industrial customers. The new natural gas line will also provide redundancy and increased reliability to the existing customers.

6. PROJECT ALTERNATIVES

There were two alternatives to the Project identified: 1) Do not install the natural gas main and above grade assembly; or 2) Choose a different route for the natural gas pipeline.

If the new pipeline and new 4" above grade valve assembly are not installed, the additional load required will not be able to be supported by the existing system.

An alternative route for the natural gas pipeline would be to route natural gas mains from another area. However, this option would require a longer pipeline and would increase the size of the project area. Therefore, Manitoba Hydro selected the most direct route for the pipeline that will provide the required natural gas capacity and minimize potential environmental effects.

7. ENVIRONMENTAL ASSESSMENT METHODS

Methods and analysis used to identify and determine potential environmental effects within the Project area consisted of the following:

1. Information on land use, topography and location of protected areas, watercourses, waterbodies, forests, wetlands, roadways, farmyards and other infrastructure was determined by a desk-top review and examination of topographic maps, drainage maps, aerial imagery and published information for the area.
2. The above-noted features were further examined and ground-truthed by a field survey of the Project study area. The field survey provided on-site observations and documentation of the presence and location of the existing and proposed new pipeline, pipeline RoW and above grade valve assemblies; vegetated areas; cultivated areas; farmyards; infrastructure; potential fish and wildlife habitat; protected areas; roads and other human-made structures or land use practices. The field survey was conducted on April 20, 2013.
3. Provincial (Manitoba Conservation Data Centre [MCDC]) and federal (Committee on the Status of Endangered Wildlife in Canada [COSEWIC], Species at Risk Act [SARA]) databases and registries were reviewed and cross-referenced to species distribution maps, habitat preferences, breeding periods and migration times to determine the potential for the presence of any species listed as endangered, threatened or of special concern within the Project area.
4. Review of information provided in the Manitoba Bird Atlas, Manitoba Herps Atlas, NatureServe Explorer, annual publications released by MCDC on MCDC Rare Plant Surveys and Stewardship Activities and recent Environmental Impact Statements (EIS) completed for projects located within the region.
5. A request was submitted to the Manitoba Conservation Data Centre for information on the presence of any rare or endangered species in the Project area.

6. A request was submitted to the Manitoba Historic Resources Branch for information on the presence of any heritage resources in the Project area.
7. Review of applicable municipal, provincial and federal environmental regulations, guidelines and/or policies.
8. Potential effects were identified based on knowledge of the Project area, previous experience with similar projects, professional experience in conducting environmental assessments and knowledge of applicable municipal, provincial and federal environmental regulations, guidelines and/or policies.
9. Canadian Environmental Assessment Act (CEAA) criteria were used to determine the potential environmental effects, the presence of residual effects once mitigation measures have been considered, if the remaining residual effects will have an environmental consequence, potential cumulative effects and the need for any follow-up or monitoring activities. Additional information on the criteria used to assess potential environmental effects is provided in Section 12.

8. EXISTING ENVIRONMENT

8.1. Overview of Project Area

The Project area lies within the Emerson Ecodistrict of the Lake Manitoba Plain Ecoregion (Smith et al. 1998). The area is very flat with slopes ranging from level to less than 2% (Agriculture and Agri-Food Canada 1998, Smith et al. 1998). The Project area consists of: farmsteads and cultivated lands; the substation and a number of turbines for the St. Joseph Wind Farm; and the Miller Environmental Corporation Waste Treatment and Processing facility, which is located in NE-2-3-1E on PTH 14 about 1.8 km west of PTH 75. Other infrastructure located within the Project area includes municipal and provincial roads, RoWs and drainage ditches; and a hydroelectric transmission line that runs parallel to PTH 75 and crosses the Project area at Road 11NE between 35-2-1-E and 26-2-1-E, and in the northern part of 26-3-1-E about 0.2 km south of Road 17NE (Figure 1).

Trees and vegetation within the Project area are limited to shelterbelts and farmsteads. There were no wetland areas observed to be present in the Project area. The Plum River and its tributaries flow through the northern part of the Project area. There were no heritage resources identified in the Project area; the closest known heritage resources sites are seven Centennial farms that are located along the length of the Project area at a distance of 0.7 km to 2 km from the west side of the Project study area. There were no Protected Areas or Wildlife Management Areas located within or adjacent to the Project area. There were no First Nation communities found to be located within the Project area; the closest First Nation community is the Roseau River Anishinabe First Nation, located on the east side of PTH75 about 3 km to 5 km from the Project area (Figure 1). Based on the agreement made between the Manitoba Métis Federation and the Province of Manitoba in September 2012, the Project area lies within Métis Natural Resource Harvesting Zone 33.

Additional information on the biophysical, cultural and socio-economic environment in the Project area is provided in the following sections.

8.2. Biophysical Environment

8.2.1. Air Quality and Greenhouse Gas Emissions

Air quality and greenhouse gas (GHG) emissions within the Project area are affected by the agricultural, industrial, recreational, rural, transportation and urban activities that occur in the region. The Province of Manitoba and Environment Canada operate air quality monitoring stations in the cities of Brandon, Flin Flon, Thompson and Winnipeg, Manitoba. The air quality monitoring stations closest to the Project area are located in the City of Winnipeg at 65 Ellen Street and at 299 Scotia Street. Air quality parameters that are monitored include: carbon monoxide (CO); particulate matter ≤ 10 microns (PM10t); particulate matter ≤ 2.5 microns (PM2.5), nitric oxide (NO); nitrogen dioxide (NO₂); nitrogen oxides (NO_x); ground level ozone (O₃); sulphur dioxide (SO₂); wind direction; and wind speed (Government of Manitoba 2013a). Recent and historical data for the measured parameters can be obtained online at the Government of Manitoba air quality website. Table 1 provides a summary of the air quality parameters for Winnipeg, Manitoba on March 07, 2013 and March 12, 2013 as an example of the available information.

Table 1: Air Quality Parameters for Winnipeg on March 07, 2013 and March 12, 2013

Recent Values - Winnipeg Air Quality												
Station	Date	Time	PM10t	PM2.5s	CO	O ₃	NO	NO ₂	NO _x	SO ₂	Wind Dir	Wind Speed
			$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppm	ppb	ppb	ppb	ppb	ppb		
Winnipeg Ellen St.	3/7/2013	3:00 PM	2.3	3.7	0.3	-	5.9	9.5	15.4	0	148	10
Winnipeg Scotia Street	3/12/2013	11:00 AM	-	3.7	0.1	40.1	1.6	3.1	4.8	-	-	-

(Source: Government of Manitoba 2013a; PM10t = particulate matter ≤ 10 microns; $\mu\text{g}/\text{m}^3$ = micrograms per cubic metre; PM2.5s = particulate matter ≤ 2.5 microns; ppm = parts per million; ppb = parts per billion; Wind Dir = wind direction in degrees; Wind Speed = wind speed in kilometers per hour [kph])

The Manitoba Ambient Air Quality Criteria (July 2005) provide the maximum tolerable, maximum acceptable and maximum desirable concentrations of air pollutants required to protect and preserve air quality for human health (Government of Manitoba 2013b). Comparison of the air quality parameters for March 07, 2013 and March 12, 2013 in Table 1 to the Manitoba Ambient Air Quality Criteria (July 2005) shows that all of the measured parameters were in the “maximum desirable” concentrations.

Environment Canada has also developed the “Air Quality Health Index” (AQHI), an index that is based on the relative risk to human health that can be caused by a combination of common air pollutants (Government of Manitoba 2013a). These pollutants include ground-level ozone (O₃), particulate matter (PM2.5) and nitrogen dioxide (NO₂). The AQHI is measured on a colour-coded scale from 1 to 10+ and the values are also grouped into risk categories (low,

moderate, high, very high) to identify the level of risk. The higher the number, the greater the health risk associated with local air quality (Environment Canada 2013a). The Province of Manitoba states that “recent monitoring has shown that the health risks associated with air quality for the cities of Brandon and Winnipeg are generally low, with an average AQHI rating of around three or lower in both locations” (Government of Manitoba 2013a). Given that the Project area is located about 60 km southwest of the City of Winnipeg, it is expected that the ambient air quality within the Project area is of similar or higher quality than the ambient air quality for the City of Winnipeg.

Environment Canada currently tracks six GHG substances as part of Canada’s efforts to identify, quantify and reduce sources of GHGs. The six substances are carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, perfluorocarbons and hydrofluorocarbons (Environment Canada 2013b). Environment Canada produces an annual “*National Inventory Report on Greenhouse Gas Sources and Sinks in Canada*” for submission to the United Nations Framework Convention on Climate Change (UNFCCC). The report includes a summary of GHG emissions for each province. Table 2 provides a summary of Manitoba’s GHG emissions from 1990 to 2010.

Table 2: Summary of Manitoba’s GHG Emissions from 1990 to 2010

Year	1990	2000	2005	2006	2007	2008	2009	2010
CO ₂ Equivalent	18,300	21,000	20,600	20,700	21,300	21,200	19,800	19,800

(Source: Environment Canada 2013b)

Of the 14 provinces and territories, Manitoba had the 7th highest GHG emissions in Canada in 1990, 2009 and 2010. Additional information on the relative amounts of each tracked substance for different GHG categories (i.e., energy, industrial processes, solvent and other product use, agriculture and waste) can be found in the annual National Inventory reports.

The existing air quality and GHG emissions within the Project area are expected to be affected by the following local activities:

- vehicle exhaust and road dust from traffic on the paved and dirt roads and trails within and adjacent to the Project area;
- emissions from agricultural activities, equipment use, livestock;
- emissions from agricultural wastes, wastewater plants and lagoons;
- seasonal applications of fertilizers and manure as part of local agricultural practices;
- seasonal burning of cropped lands as part of agricultural practices; and
- generation and transportation of airborne pollutants from the surrounding agricultural, commercial, industrial, recreational, rural and urban activities in the RM of Montcalm.

8.2.2. Climate

Climate can be defined as the generally prevailing weather conditions of a region throughout the year, and is typically described by variables such as air pressure, cloud cover, humidity, precipitation, hours of sunshine, temperature, wind speed and wind direction. The Project area

is located in the Emerson Ecodistrict of the Lake Manitoba Plain Eco-region, which is in the warmest subdivision of the Grassland Transition Ecoclimatic Region in southern Manitoba (Smith et al. 1998). The climate is characterized as having short, warm summers and long, cold winters (Smith et al. 1998).

Environment Canada collected climate data for several areas within Canada from 1971 to 2000. The Environment Canada weather reporting stations considered to be closest to the Project area are located at the Town of Morris at 49°26'00 N, 97°29'00 W and at the Town of Emerson at 49°02'00 N, 97°11'00 W. Data from the Town of Morris did not include information on temperature; therefore, data from the Emerson station were used to represent the climate data for the Project area. Table 3 provides information on a number of climate variables selected from the Canadian Climate Normals data from 1971 to 2000 for the Town of Emerson (Environment Canada 2013c). The daily average temperature in the Emerson area is about 3.4 °C. The daily average temperature in January is about -17.1 °C while in July the daily average temperature is about 19.8 °C. The mean annual precipitation is about 562.6 mm with about 440.7 mm falling as rain and 122.5 mm falling as snow.

Table 3: Canadian Climate Normals 1971-2000 for Emerson, Manitoba

Parameter:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Daily Average Temperature (°C)	-17.1	-13.2	-5.6	5.1	13.5	17.8	19.8	18.9	13.1	6.1	-4.7	-13	3.4
Daily Maximum Temperature (°C)	-12.1	-8	-0.6	11.3	20.6	24.2	26.1	25.5	19.2	11.6	-0.7	-8.4	9.1
Daily Minimum Temperature (°C)	-22	-18.3	-10.6	-1.1	6.3	11.3	13.5	12.2	6.9	0.7	-8.7	-17.7	-2.3
Extreme Maximum Temperature (°C)	7.8	15.6	23.3	37.2	41.1	40	44.4	39.5	38.5	33	22.2	9.4	-
Date (yyyy/dd)	1952/31	1958/25	1946/27	1952/27	1934/30	1933/18	1936/12	1988/10	1983/02	1992/01	1975/05	1877/15	-
Extreme Minimum Temperature (°C)	-44.4	-46.7	-38.9	-26.1	-10.6	-3.3	1.1	-1.1	-12.2	-21.1	-40	-40.6	-
Date (yyyy/dd)	1899/07	1899/09	1962/01	1970/01	1878/03	1945/03	1948/18	1935/30	1929/17	1936/25	1985/28	1967/31	-
Rainfall (mm)	0.4	0.5	8.8	24.1	57.1	87.4	84.8	72.9	56.1	36.2	9.2	3.2	440.7
Snowfall (cm)	25.5	20.8	16	7	0.2	0	0	0	0.1	6.1	21.9	24.9	122.5
Precipitation (mm)	25.9	21.3	24.8	30.7	57.3	87.4	84.8	72.9	56.2	42.3	31	28.2	562.6

(Source: Environment Canada 2013c)

8.2.3. Noise

Existing noise levels in the Project area and areas immediately surrounding the Project area are expected to be typical of a mainly agricultural area with small urban centres, residential areas and the presence of commercial, industrial and recreational activities. Sources of noise identified for the Project area include:

- light, medium and heavy vehicle traffic on PTH 75, PR 201, PR 14 and other roads within and surrounding the Project area;
- agricultural equipment use and practices within and surrounding the Project area;
- operation of the St. Joseph Wind farm turbines;
- commercial, industrial and recreational activities in the RM of Montcalm;
- air traffic travelling to and from the City of Winnipeg and other area airports (helicopters, small planes, crop-dusting, commercial air traffic);
- human activities in urban and rural areas; and
- bird migration, nesting and breeding activities.

8.2.4. Terrain, Soils and Vegetation

As noted above, the Project area lies within the Emerson Ecodistrict of the Lake Manitoba Plain Ecoregion (Smith et al. 1998) and the area is very flat with slopes ranging from level to less than 2% (Agriculture and Agri-Food Canada 1998, Smith et al. 1998). Soils are classified as dominantly Black Chernozems (Red River and Emerson associations) in association with Humic Gleysols (poorly drained soils of the Red River and Emerson associations) (Agriculture and Agri-Food Canada 1998). The flatness of the area and the high clay content of the Red River Valley soils results in a large part of the area being classified as imperfectly to poorly drained (Agriculture and Agri-Food Canada 1998).

Smith et al. (1998) notes that the native vegetation of tall prairie grasses and associated herbs in the Emerson Ecodistrict has mostly disappeared due to extensive cultivation within the ecodistrict. Green ash (*Fraxinus pennsylvanica*), Manitoba maple (*Acer negundo*) and white elm (*Ulmus americana*) with shrubs such as hazel (*Corylus* spp.) and saskatoon (*Amelanchier alnifolia*) still occur in strips along waterways, with bur oak (*Quercus macrocarpa*) occurring on higher riverbank areas that do not flood (Smith et al. 1998).

The MCDC lists 101 species of vascular plants that have been documented to be present in the Lake Manitoba Plain Ecoregion (MCDC 2012). Section 8.2.8 below provides information on potential species at risk that may be present within the Project area.

The field survey conducted on April 20, 2013 found that the pipeline, pipeline RoW and new valves and above grade valve assemblies will be located in agricultural fields, road allowances and drainage ditches. Photos 1 to 5 provide examples of the existing terrain, soils and vegetation present at the above grade valve assembly locations, within the existing RoW and within the proposed new RoW.



Photo 1: View facing south of the existing above grade valve assembly, existing RoW and Project area at the south side of PR201. April 20, 2013.



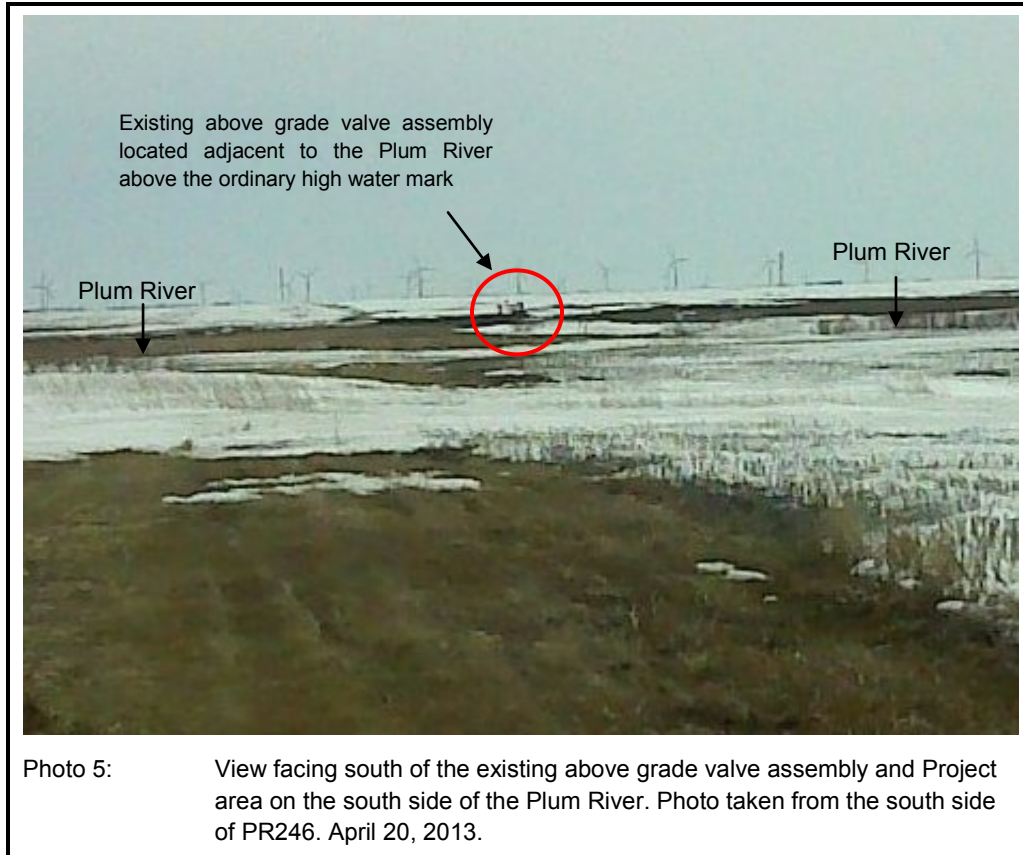
Photo 2: View facing south of the existing RoW and Project area at the south side of Road 12NE. April 20, 2013.



Photo 3: View facing south of the Project area and the existing RoW at the south side of Road 15NE. April 20, 2013.



Photo 4: View facing north of the existing above grade valve assembly and Project area located on the south side of the Plum River. Manitoba Hydro file photo, July 27, 2012.



The majority (>90%) of the vegetation within the Project area is cultivated fields. Small patches of grasses (Poaceae) and forbs such as goldenrod (*Solidago* spp.) were the only vegetation type observed to be present in the existing RoW and proposed new RoW. This vegetation was limited to small patches in and around the above grade assemblies and in the road allowances and ditches. The vegetation in the road allowances and ditches appeared to have been mowed. The existing RoW and proposed RoW did not appear to pass through any shelterbelts or other areas of trees or shrubs.

8.2.5. Wildlife and Wildlife Habitat

Smith et al. (1998) states that the Lake Manitoba Plain Ecoregion provides habitat for coyote (*Canis latrans*), ground squirrels, rabbits, waterfowl and white-tailed deer (*Odocoileus virginianus*). The MCDL lists six species of invertebrate animals and 38 species of vertebrate animals that have been documented to be present in the Lake Manitoba Plain Ecoregion (MCDL 2012). Wildlife observed to be present within the Project area during the April 20, 2013 field survey included American crow (*Corvus brachyrhynchos*), Canada geese (*Branta canadensis*), one merlin (*Falco columbarius*) and a number of snow buntings (*Plectrophenax nivalis*). A ground squirrel hole was found on the south side of PR246 on the north side of the Plum River. There were no stick nests, tracks, burrows or other signs of wildlife presence or use observed during the April 20, 2013 field survey.

As noted above, the Project area consists mainly of cultivated land, with trees and vegetation limited to shelterbelts and occasional patches of wooded or grassy areas. The following

information sources were examined to determine potential wildlife species that could be present in the type of habitats provided within the Project area:

- Important Bird Areas (<http://www.ibacanada.ca>)
- MCDC database (<http://www.gov.mb.ca/conservation/cdc/db.html>);
- Manitoba Breeding Bird Atlas (<http://www.birdatlas.mb.ca>);
- Manitoba Herps Atlas (http://www.naturenorth.com/Herps/Manitoba_Herps_Atlas.html);
- NatureServe Explorer database (<http://www.natureserve.org/explorer/index.htm>);
- MCDC annual reports from 2003 to 2011 on MCDC rare species surveys and stewardship activities (<http://www.gov.mb.ca/conservation/cdc/pubs.html>); and
- the St. Joseph Wind Energy Project Environmental Impact Study Report (Helimax 2008).

The study area for the Project lies within a portion of the study area for the St. Joseph Wind Energy Project. The St. Joseph Wind Energy Project Environmental Impact Study Report (EISR) (Helimax 2008) reported the presence of 77 bird species, four bat species, seven non-bat mammalian species, three butterfly species and five amphibian species within the study area for the St. Joseph Wind Energy Project. Appendix B provides a summary of the wildlife species noted to be present in the St. Joseph Wind Project study area.

The areas that will be affected by the Project consist of flat, cultivated fields, road allowances and drainage ditches that are regularly disturbed by activities related to agriculture, road maintenance, drainage ditch maintenance and wind turbine operation. There are very few areas that would provide water, ground cover, tree cover, undisturbed areas or other habitat types required by many wildlife species for breeding, nesting and rearing of young. As such, it is expected that the majority of the habitat use within the Project area is limited to foraging, feeding and seasonal migratory movements.

Section 8.2.8 below provides information on potential species at risk that may also be present within the Project area.

8.2.6. Wetlands

There were no permanent or temporary wetland areas observed to be present in the Project area. Plant species indicative of wetland areas such as cattails (*Typha* spp.), reeds (*Phragmites* spp.) and/or sedges (*Carex* spp.) were not observed to be present in the Project area. The majority of the drainage ditches were frozen and snow-covered during the field survey; therefore, these species may be present in the Project area drainage ditches during the growing season.

8.2.7. Groundwater

Smith et al. 1998 cites the Red River as the principal source of water in the Emerson Ecodistrict, with limited supplies of groundwater for domestic and livestock use available from small, sandy and gravelly aquifers associated with glacial till that underlies the clay deposits at the surface. There were no provincial groundwater reports available for the RM of Montcalm. Rutulis (1973) indicated that groundwater in the adjacent RM of Morris is present in the carbonate bedrock in

the northern part of the RM, and in limestone beds in the shale bedrock areas in the southern part of the RM. Rutulis (1973) noted that the majority of the groundwater in the carbonate rock aquifer in the RM of Morris is saline and not potable. Rutulis (1988) also noted that the carbonate rock aquifer is less susceptible to surface pollution due to the layer of thick clay and glacial till that overlies the carbonate rock layer. A preliminary geotechnical investigation carried out by AMEC in 2007 for the St. Joseph Wind Energy Project found the groundwater level to be at 50 to 70 m below the surface (Helimax 2008). The potential for environmental impacts to groundwater due to irrigation is considered to be minimal in 97.6% of the RM of Montcalm as a result of the soil and slope characteristics in the region (Agriculture and Agri-Food Canada 1998). The layer of clay that overlies the groundwater sources within the Project area reduces the potential for the infiltration of pollutants from surface activities to groundwater sources.

8.2.8. Surface Water

The Project study area includes a portion of the Plum River (Figure 1). The Project does not include any instream works or watercourse crossings. As such, there were no effects predicted to surface water as a result of the Project, and no further information on the Plum River was collated for this report.

8.2.9. Fish and Fish Habitat

The Project study area includes a portion of the Plum River (Figure 1). The Project does not include any instream works or watercourse crossings. As such, there were no effects predicted to fish or fish habitat as a result of the Project, and no further information on the Plum River was collated for this report.

8.2.10. Species at Risk

Potential species at risk in the Project area were identified by review of the following information sources:

- The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) database (www.cosewic.gc.ca);
- Species At Risk (SAR) database (www.speciesatrisk.gc.ca);
- MCDC database (<http://www.gov.mb.ca/conservation/cdc/db.html>);
- Manitoba Breeding Bird Atlas (MBA) (<http://www.birdatlas.mb.ca>);
- Manitoba Herps Atlas (MHA) (http://www.naturenorth.com/Herps/Manitoba_Herps_Atlas.html);
- NatureServe Explorer database (<http://www.natureserve.org/explorer/index.htm>);
- MCDC annual reports from 2003 to 2011 on MCDC rare species surveys and stewardship activities;
- the St. Joseph Wind Energy Project Environmental Impact Study Report (Helimax 2008); and
- a request was sent to MCDC on February 20, 2013 to determine if there are any species at risk known to be present within the Project area.

The response from MCDC in regards to the presence of species at risk in the Project area indicated that there were no known occurrences of rare species within the area of interest at the time of the request (Appendix C). Based on review of the information sources and the type of habitats found within the Project area, a total of 15 species that are listed as endangered, threatened or of special concern are considered to be potentially present within the Project area. Table 4 provides a summary of the 15 species, and the federal and provincial status of each of the species.

As noted in Section 8.2.5, the areas that will be affected by the Project consist of flat, cultivated fields, road allowances and drainage ditches that are regularly disturbed by activities related to agriculture, road maintenance, drainage ditch maintenance and wind turbine operation. There are very few areas that would provide water, ground cover, tree cover, undisturbed areas or other habitat types required by many wildlife species for breeding, nesting and rearing of young. As such, it is expected that the majority of the habitat use within the Project area is limited to foraging, feeding and seasonal migratory movements.

Based on the type of habitat available and level of past and present human activity within the Project area, it is not expected that the Project area provides breeding, nesting or rearing habitat for any of the identified terrestrial species at risk; habitat use is likely limited to occasional feeding and movement through the Project area.

Table 4: Species Potentially Present Within the Project Area that are Listed as Endangered, Threatened or of Special Concern

Common Name	Scientific Name	Taxon	MCDC Rank ^a	MESA Status	COSEWIC Status	Schedule	SARA Status
American Badger	<i>Taxidea taxus taxus</i>	Mammals	n/a ^b	n/a	Special Concern	n/a	n/a
Baird's Sparrow	<i>Ammodramus bairdii</i>	Birds	G4; S1S2B	Endangered	Special Concern	No schedule	No Status
Barn Swallow ^c	<i>Hirundo rustica</i>	Birds	G5; S5B	n/a	Threatened	No schedule	No Status
Bobolink ^c	<i>Dolichonyx oryzivorus</i>	Birds	G5; S4B	n/a	Threatened	No schedule	No Status
Burrowing Owl	<i>Athene cunicularia</i>	Birds	G4; S1B	Endangered	Endangered	Schedule 1	Endangered
Chimney Swift	<i>Chaetura pelagica</i>	Birds	G5; S2B	Threatened	Threatened	Schedule 1	Threatened
Common Nighthawk	<i>Chordeiles minor</i>	Birds	G5; S3B	Threatened	Threatened	Schedule 1	Threatened
Cooper's Hawk	<i>Accipiter cooperii</i>	Birds	G5; S4S5B	n/a	Not at Risk	n/a	n/a
Eastern Wood-Pewee	<i>Contopus virens</i>	Birds	n/a	n/a	Special Concern	n/a	n/a
Golden-Winged Warbler	<i>Vermivora chrysoptera</i>	Birds	G4; S3B	Threatened	Threatened	Schedule 1	Threatened
Little Brown Myotis	<i>Myotis lucifugus</i>	Mammals	G5; S2N, S5B	n/a	Endangered	No schedule	No Status
Monarch ^c	<i>Danaus plexippus</i>	Arthropods	n/a	n/a	Special Concern	Schedule 1	Special Concern
Northern Leopard Frog ^c	<i>Lithobates pipiens</i>	Amphibians	n/a	n/a	Special Concern	Schedule 1	Special Concern
Red-Headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Birds	G5; S2S3B	Threatened	Threatened	Schedule 1	Threatened
Short-Eared Owl	<i>Asio flammeus</i>	Birds	G5; S2S3B	Threatened	Special Concern	Schedule 1	Special Concern

(Sources: COSEWIC 2013; MCDC 2013; MHA 2013; MBA 2013; SAR 2013)

^aExplanation of the MCDC Rank is provided in Appendix D; ^b n/a = not applicable; ^c documented to be present within the St. Joseph Wind Farm Project study area (Helimax 2008)

8.3. Cultural and Socio-Economic Environment

8.3.1. Land Use

The majority of the lands within the Project area are used for annual crops, with smaller areas used for forage crops, rural and urban development, and transportation (Agriculture and Agri-Food Canada 1998). Table 5 provides a summary of the landuse classification for the RM of Montcalm.

Table 5: Summary of the Landuse Classification for the RM of Montcalm

Land Class	RM of Montcalm
Annual Crop Land	88.1%
Forage	0.2%
Grassland	3.5%
Trees	2.7%
Wetland	0.1%
Water	1.5%
Urban and transportation	3.9%
Total	100%

(Source: Agriculture and Agri-Food Canada 1998)

The Project study area consists of: privately owned farmsteads and cultivated lands; the substation and a number of turbines for the St. Joseph Wind Farm; and the Miller Environmental Corporation Waste Treatment and Processing facility, which is located within the study area, but not directly in the area of the new pipeline. Other infrastructure located within the Project study area includes municipal and provincial roads, RoWs and drainage ditches; and a hydroelectric transmission line that runs parallel to PTH 75 and crosses the Project area (Figure 1). There were no reserve lands found to be located within the Project study area.

As noted in Section 3, Manitoba Hydro will be seeking to acquire an easement of 15 m to provide the area needed to install and operate the new 4" steel natural gas pipeline. A total of 31 private landowners were identified that will be affected by (16 landowners) or are adjacent to (15 landowners) the Project area. Additional information on landowner contact and discussions in relation to the new easement and Project area are provided in Appendix F.

8.3.2. Resource Use

Resource use in the Project area is mainly agricultural activities and farmsteads that utilize the soil and water resources within the Project area. Drinking water is supplied to the RM of Montcalm as part of the Pembina Valley Water Cooperative Inc. (PVWC) system, which draws water from the Red River outside of the Project area (Pembina Valley Water Cooperative Inc. 2011). The Project area is located within Game Hunting Area 33, which is also Métis Natural Resource Harvesting Zone 33. There are very few areas available for hunting within the Project area; however, hunting for migrating waterfowl and white-tailed deer may occur within the Project area during the fall hunting season. The Snowmobilers of Manitoba (Snoman Inc.)

operates a snowmobile trail that parallels PTH75 between St. Jean Baptiste and Letellier under adequate snow conditions during the winter season (Snoman Inc. 2013). The Project area lies within Open Trapping Zone 1; therefore, trapping for animals such as coyotes and raccoons may occur in the region, but it is an open trapping area with no registered trapping lines.

8.3.3. Protected Areas

There were no Protected Areas or Wildlife Management Areas found to be located within or adjacent to the Project study area.

8.3.4. Heritage Resources

A request was submitted to the Manitoba Historic Resources Branch (MHRB) for information on the presence of any heritage resources within the Project study area. MHRB provided a list of the known archeological sites, Centennial Farms, Designated Heritage sites and Plaques located in the area of interest. Review of the MHRB information showed that there are no known archeological sites, Designated Heritage sites or Plaques located within or immediately adjacent to the Project study area.

The MHRB data indicated that there are 12 Centennial Farms located within the area of interest. Seven of the Centennial Farms are located 0.7 km to 2 km west of the Project study area. The approximate locations of the seven farms are as follows:

- Sabourin Family Farm on Road 16NE about 3.75 km west of PTH75 and 1 km west of the Project study area;
- Sarrasin Family Farm on PTH14 about 5.5 km west of PTH75 and 2 km west of the Project study area;
- Sarrasin Family Farm south of PTH14 about 5.5 km west of PTH75 and 2 km west of the Project study area;
- Brais Family Farm on Road 10NE about 4.8 km west of PTH75 and 0.7 km west of the Project study area;
- Perron Family Farm on Road 10NE about 5 km west of PTH75 and 0.9 km west of the Project study area;
- Brais Family Farm on PR201 about 4.8 km west of PTH75 and 0.7 km west of the Project study area; and
- Brais Family Farm on PR246 in the community of St. Joseph.

Appendix E provides additional information on the history, ownership and locations of the Centennial Farms (MHRB 2013).

8.4. Public Engagement

Manitoba Hydro conducted a public engagement program for the Project in April 2013 to obtain feedback from potentially affected and interested individuals and communities. The parties identified for the Project included the RM of Montcalm, First Nation communities (i.e., Peguis First Nation, Roseau River Anishinabe First Nation), the Manitoba Métis Federation, local

landowners and the public. Manitoba Hydro attempted to meet with all communities and organizations during the public engagement program. Manitoba Hydro held a municipal council meeting with the RM of Montcalm; met with a representative from Roseau River Anishinabe First Nation; provided a project contact to all potentially affected and interested parties through a variety of notification methods (e.g., direct mailings, a postal code drop, radio and newspaper advertisements); and held a public open house to allow the public and interested parties to discuss the Project with Manitoba Hydro representatives. A detailed summary of the public engagement program methods, activities and results is provided in Appendix F.

9. POTENTIAL ENVIRONMENTAL EFFECTS

Potential environmental effects were defined as the potential effects on the biophysical, cultural or socio-economic resources within the proposed project area that could occur as a result of the proposed project activities. The Project area consists of flat, cultivated fields, road allowances and drainage ditches that are regularly disturbed by activities related to agriculture, road maintenance, drainage ditch maintenance and wind turbine operation. As such, the project activities are not expected to have significant environmental effects on the existing environment within the Project area. A summary of the potential environmental effects during the construction and O&M phases of the Project is provided below.

9.1. Biophysical Effects/Issues

9.1.1. Air Quality and Greenhouse Gases

During the Project construction activities, there will be air emissions due to exhaust and/or dust from the use of stationary and mobile project equipment. These emissions may cause a minor, temporary, localized effect on air quality and GHG emissions during the Project construction phase.

The Project will require the temporary disturbance and/or alteration of some of the vegetation present at the location of the existing 2" and 3" above grade valve assemblies to be removed, and at the new 4" above grade valve assembly location. However, there will be no permanent loss of vegetation within the Project area that would significantly affect existing carbon resources in the area.

During the O&M phase of the Project, there is the potential for natural gas leaks along the pipeline and/or from leaks on fittings or equipment at the new 4" above grade valve assembly. Manitoba Hydro will conduct annual maintenance and inspections of the pipeline and new 4" above grade valve assembly to reduce the potential for the occurrence of leaks.

9.1.2. Noise

During the Project construction activities, the types of noises emitted will be dominated by equipment engines with miscellaneous short-term noise emissions from the use of a ½ to 1 ton truck, bulldozer, directional drilling, front end loader, sideboom, tandem/trailer, trackhoe, trencher, vacuum truck, welding rig and tools. These noises may cause a minor, temporary,

localized effect on noise within the Project area. The Project O&M activities are not expected to have an effect on noise within the Project area.

9.1.3. Climate

The Project construction and O&M activities are not expected to have an effect on the local climate (i.e., no effect on air pressure, cloud cover, humidity, precipitation, hours of sunshine, temperature, wind speed and wind direction).

9.1.4. Terrain, Soils and Vegetation

As described in Section 3, the Project construction and O&M activities will take place in the RoW and in the northern part of NW-14-2-1-E on the south side of PR 201. Potential effects to terrain, soils and vegetation due to the Project construction activities include:

- Alteration of the existing terrain, i.e., change in grade, slope or stability.
- Contamination from petroleum spills or release of hazardous materials as a result of accidents and malfunctions that may occur during the Project construction activities.
- Contamination from release of water used for hydrostatic testing.
- Disturbance, compaction and/or loss of soils that are present within the work areas.
- Disturbance and/or alteration of the vegetation present within the work areas.
- Introduction of invasive plant species from equipment and vehicles.
- Increased potential for wildfires due to the use of gasoline, oil and electronically operated equipment in the Project area.

The construction activities will take place within an existing RoW and previously disturbed area for the length of the pipeline, and in a previously disturbed area at the new 4" above grade valve assembly and existing 2" and 3" above grade valve assemblies. The terrain, soils and vegetation that will be affected by the Project consists of flat, cultivated fields, road allowances and drainage ditches that are regularly disturbed by activities related to agriculture, road maintenance, drainage ditch maintenance and wind turbine operation. The vegetation in the majority of the existing RoW and proposed RoW consists of row crops during the growing season and stubble or bare ground during the non-growing season. Other vegetation present within the existing RoW and proposed RoW is limited to grasses and forbs such as goldenrod, which were observed to be present at the above grade valve assembly sites, road allowances and drainage ditches. Based on the field survey, MCDC information and previous environmental studies in the Project area, it is not expected that there are any plant species listed as endangered, threatened or of special concern present within the Project RoW or at the above grade valve assembly locations.

Potential effects to terrain, soils and vegetation due to the Project O&M activities include:

- Release of hazardous materials as a result of accidents and malfunctions that may occur during the Project O&M activities.

During the O&M phase of the Project, there is the potential for natural gas leaks along the pipeline and/or from leaks on fittings or equipment at the new 4" above grade valve assembly. Manitoba Hydro will conduct annual maintenance and inspections of the pipeline and new 4" above grade valve assembly to reduce the potential for the occurrence of leaks.

9.1.5. Wildlife and Wildlife Habitat

Potential effects to wildlife and wildlife habitat due to the Project construction and O&M activities include:

- Wildlife species present in the Project area may be temporarily disturbed by noise and activity during the Project construction and/or O&M activities.
- Disturbance and/or alteration of terrestrial habitat at the new 4" above grade valve assembly location.

It is expected that the wildlife species known to be present or potentially present within the Project area would not be nesting or breeding in the habitat available for use in the existing RoW, proposed new RoW, at the new 4" above grade valve assembly location or at the existing 2" and 3" above grade valve assembly location. The Project area consists of flat, cultivated fields, road allowances and drainage ditches that are regularly disturbed by human activities related to agriculture, road maintenance, drainage ditch maintenance and wind turbine operation. As such, it is expected that the wildlife species present within the Project area are habituated to the presence of humans and human activity. The area of habitat that will be disturbed or altered is an 8 m by 8 m area of previously cultivated and/or disturbed land that has low habitat value for most wildlife species.

9.1.6. Wetlands

There were no wetland areas observed to be present in the Project area. As such, there were no potential effects to wetlands identified for the Project.

9.1.7. Groundwater

Potential effects to groundwater due to the Project construction activities include:

- Accidental release of drilling mud and/or drilling mud additives if a frac-out (i.e., release of drilling mud) occurs during the directional drilling activities.
- Accidental release and/or transport of fuel, grease, mud, soil or other deleterious substances during the Project construction activities.
- Accidental release and/or transport of water used for hydrostatic testing.

As noted in Section 8.2.7, the layer of clay that overlies the groundwater sources within the Project area reduces the potential for the infiltration of pollutants from surface activities to groundwater sources, and a preliminary geotechnical investigation carried out by AMEC in 2007 for the St. Joseph Wind Energy Project found the groundwater level to be at 50 to 70 m below the surface (Helimax 2008). The potential for environmental impacts to groundwater due to irrigation is considered to be minimal in 97.6% of the RM of Montcalm as a result of the soil and slope characteristics in the region (Agriculture and Agri-Food Canada 1998). Also, the potential

effects to groundwater identified for the Project could only occur in the event of an accidental release. The mitigation measures provided in Table 6 are expected to minimize the probability of an accidental release. Based on the depth from the ground surface of the groundwater resources in the Project area, the layer of clay that overlies the groundwater resources in the Project area and the proposed mitigation measures, the potential effects to groundwater due to the Project construction activities are expected to be not significant.

The Project O&M activities will include: a yearly leak survey of the pipeline and the new 4" above grade valve assembly to ensure that there are no leaks on any of the fittings or equipment; yearly maintenance of the site, which includes checking for leaks and equipment maintenance (greasing of valves, replacing regulator springs, lighting replacements, etc.); snow-clearing of the site, as necessary; and SCADA monitoring at the site will identify any emergency situations occurring on the pipeline such as a damage to the pipeline. SCADA monitoring will trigger alarms at specific low pressure settings (monitored in real-time) and the appropriate personnel will be notified to respond and rectify the situation. Therefore, the Project O&M activities are not expected to have an effect on groundwater within the Project area.

9.1.8. Surface Water

The Project does not include any instream works or watercourse crossings. As such, there were no potential effects to surface water identified for the Project.

9.1.9. Fish and Fish Habitat

The Project does not include any instream works or watercourse crossings. As such, there were no potential effects to fish or fish habitat identified for the Project.

9.1.10. Species At Risk

Potential effects to species at risk due to the Project construction and/or O&M activities include:

- Species at risk present in the Project area may be temporarily disturbed by noise and activity during the Project construction and/or O&M activities.
- Disturbance and/or alteration of terrestrial habitat at the new 4" above grade valve assembly location.

9.2. Cultural and Socio-Economic Effects/Issues

9.2.1. Land Use

During the Project construction activities, local traffic may need to be periodically rerouted or stopped due to the use and operation of equipment in the RoW, at the location of the new 4" above grade valve assembly and at the location of the existing 2" and 3" valve assemblies to be removed. These traffic interruptions are required for the Health and Safety of the public, Manitoba Hydro employees and Manitoba Hydro contractors. This traffic interruption may cause a minor, temporary, localized effect on land use for local residents.

The Project O&M activities are not expected to have an effect on land use within the Project area.

9.2.2. Resource Use

During the Project construction activities, local traffic may need to be periodically rerouted or stopped due to the use and operation of equipment in the RoW, at the location of the new 4" above grade valve assembly and at the location of the existing 2" and 3" valve assemblies to be removed. These traffic interruptions are required for the Health and Safety of the public, Manitoba Hydro employees and Manitoba Hydro contractors. This traffic interruption may cause a minor, temporary, localized effect on resource use for local residents.

The Project O&M activities are not expected to have an effect on resource use within the Project area.

9.2.3. Protected Areas

There were no Protected Areas or Wildlife Management Areas found to be located within or adjacent to the Project area. As such, there were no potential effects to Protected Areas identified for the Project.

9.2.4. Heritage Resources

There were no heritage resources found to be located within the Project study area. There are seven Centennial farms located 0.7 km to 2 km west of the Project study area. The Project construction and O&M activities are not expected to have an effect on the Centennial Farms. As such, there were no potential effects to heritage resources identified for the Project.

Manitoba Hydro's EPP for the Project includes a stop work order in the event that heritage resources are discovered. When archaeological and historic artifacts are uncovered during construction, work at the location will cease immediately, and the discovery will be reported to the Construction Supervisor. The Construction Supervisor will contact the Manitoba Hydro Environmental and Licensing Department for further instructions. Manitoba Hydro will comply with all applicable legislation and guidelines regarding heritage resources.

9.2.5. Stakeholder Perspectives

Stakeholder issues were identified and addressed through a public engagement program. The public engagement program (Appendix F) indicated that there was support for the Project by the local municipality, landowners and the general public in the Project area. Many viewed the project as having long term potential benefits with some short term potential inconveniences with regards to agricultural operations.

9.2.6. Aboriginal Issues, Concerns and Interests

There are no First Nation communities located within the Project area. The closest First Nation community is the Roseau River Anishinabe 2B First Nation, located on the east side of PTH75 about 3 km to 5 km from the Project area (Figure 1). The Project area lies within Métis Natural Resource Harvesting Zone 33.

Manitoba Hydro contacted Peguis First Nation, Roseau River Anishinabe First Nation and the Manitoba Métis Federation to notify these communities about the Project and solicit any comments, questions or concerns. The communities were provided with a package of the Project information and invited to attend the Open House. A Roseau River Anishinabe First Nation representative indicated that they anticipated the Custom Council would like a presentation on the Project. Manitoba Hydro will work with Roseau River Anishinabe First Nation to coordinate a meeting with their Custom Council.

As noted in Section 8.4, Manitoba Hydro met with a representative from Roseau River Anishinabe First Nation to discuss the Project. During the meeting, there was a question regarding whether the pipeline would affect any waterways. Manitoba Hydro indicated that the Project will not be crossing any waterways. Manitoba Hydro also indicated that Manitoba Hydro uses directional drilling and follows Fisheries and Oceans Canada (DFO) guidelines for all watercourse crossings.

Manitoba Hydro continues to endeavour to meet with the Peguis First Nation and Manitoba Métis Federation to discuss this Project, as well as other projects being undertaken by Manitoba Hydro.

The landbase within the Project area consists of private lands that are used mainly for agriculture. Based on the wildlife species present or potentially present in the Project area, hunting is likely limited to deer and migrating waterfowl, and trapping is likely limited to coyotes and raccoons. Therefore, it is anticipated that traditional resource activities (e.g., hunting, trapping, fishing, gathering of plants) are not likely being practiced in the Project area.

10. PROPOSED MITIGATION

Manitoba Hydro supports the need to protect and preserve the natural environment and heritage resources affected by its projects and facilities. This goal can only be achieved with the full commitment of Manitoba Hydro employees, consultants and contractors at all stages of projects, from planning and design through construction and operational phases. As stated in the Corporate Environmental Management Policy:

Manitoba Hydro is committed to protecting the environment. In full recognition of the fact that corporate facilities and activities affect the environment, Manitoba Hydro integrates environmentally responsible practices into its businesses, thereby:

- preventing or minimizing any adverse impacts, including pollution, on the environment, and enhancing positive impacts;
- continually improving our Environmental Management System;
- meeting or surpassing regulatory requirements and other commitments;
- considering the interests and utilizing the knowledge of our customers, employees, communities, and stakeholders who may be affected by our actions;
- reviewing our environment objectives and targets annually to ensure improvement in our environmental performance; and

- documenting and reporting our activities and environmental performance.

In keeping with this policy, Manitoba Hydro's Environmental Protection Program for this Project will include:

- the development of a Project-specific EPP, which will include general environmental protection measures for construction activities, mitigation measures specific to pipeline construction and installation, erosion and sediment control plans and a frac-out contingency plan;
- inspection of work areas and work activities during construction;
- post-construction monitoring, and
- adherence to all applicable federal, provincial and municipal acts and regulations.

In addition to the above, the directional drilling contractor must use the approved Manitoba Hydro "*Horizontal Directional Drilling Execution Plan*" or other format as approved by the Project engineer. Directional drilling activities will not commence until this execution plan is in place, reviewed and accepted by Manitoba Hydro. The potential environmental effects identified in Section 9 will be mitigated using the measures outlined in Manitoba Hydro's EPP and in the following regulatory guidance documents:

- DFO Manitoba Operational Statement for High Pressure Directional Drilling, Version 3.0
- Manitoba Natural Gas and Petroleum Liquid Pipeline Hydrostatic Test Discharge Guidelines (MWS 2007)
- Petroleum Industry Activity Guidelines for Wildlife Species at Risk in the Prairie and Northern Region (Environment Canada 2009)
- The Migratory Bird Convention Act
- The Pipeline Industry and the Migratory Birds Act (Canadian Pipeline Environment Committee 2004)

Table 6 provides a summary of the measures proposed to mitigate the potential environmental effects of the Project with construction in the late spring to mid-summer season.

Table 6: Summary of Proposed Mitigation Measures for Late Spring to Mid-Summer Season Work Activities

Project Component	Environmental Issue	Mitigation Plans
General Project Mitigation	<ul style="list-style-type: none"> Site management, overall environmental management. 	<ul style="list-style-type: none"> Implementation of measures outlined in Manitoba Hydro's EPP for the Project including erosion and sediment control measures. Isolation of the work areas as needed to prevent the release or transport of deleterious substances (e.g., fuel, grease, mud) or debris within the Project area. Safety signage and safe work practices will be used at all work areas for the Project as part of site management practices. Performance of work inspections and monitoring before, during and after construction activities.
Air Quality and GHG	<ul style="list-style-type: none"> During the Project construction activities, there will be air emissions due to exhaust and/or dust from the use of stationary and mobile project equipment. These emissions may cause a minor, temporary, localized effect on air quality. The Project will require the temporary disturbance and/or alteration of some of the vegetation present at the location of the existing 2" and 3" above grade valve assemblies to be removed, and at the new 4" above grade valve assembly location. During the O&M phase of the Project, there is the potential for natural gas leaks along the pipeline and/or from leaks on fittings or equipment at the new 4" above grade valve assembly. 	<ul style="list-style-type: none"> Mobile and stationary construction equipment will be required to meet appropriate federal emission standards. Dust control measures such as spraying access roads/areas with water will be implemented as needed. Manitoba Hydro will conduct annual maintenance and inspections of the pipeline and new 4" above grade valve assembly to reduce the potential for the occurrence of leaks.
Noise	<ul style="list-style-type: none"> During the Project construction activities, there will be noises emitted by equipment engines. These noises may cause a minor, temporary, localized effect on noise. 	<ul style="list-style-type: none"> Project activities will occur during day-time hours to minimize the effects of noise to landowners and local wildlife. Manitoba Hydro will follow all applicable noise bylaws. All equipment used on site will be fitted with appropriate mufflers and be well maintained to minimize noise levels off the site.
Climate	<ul style="list-style-type: none"> No effects identified. 	<ul style="list-style-type: none"> None required as no effects to climate were identified.

Project Component	Environmental Issue	Mitigation Plans
<p>Terrain, Soils and Vegetation</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Alteration of the existing terrain, i.e., change in grade, slope or stability. • Contamination from petroleum spills or release of hazardous materials as a result of accidents and malfunctions that may occur during the Project construction activities. • Disturbance, compaction and/or loss of soils that are present within the work areas. • Disturbance and/or alteration of the vegetation present within the work areas. • Introduction of invasive plant species from equipment and vehicles. • Increased potential for wildfires due to the use of gasoline, oil and electronically operated equipment in the Project area. <p>O&M:</p> <ul style="list-style-type: none"> • Release of hazardous materials as a result of accidents and malfunctions that may occur during the Project O&M activities. 	<ul style="list-style-type: none"> • Implementation of measures outlined in Manitoba Hydro’s EPP for the Project. • Compliance with all applicable federal, provincial and municipal legislation, codes and guidelines. • Storage and disposal of dangerous goods will occur according to <i>Workplace Safety and Health Act</i> and Storage and Handling of Petroleum Products and Allied Products Regulation 188/2001. • Storage and disposal of all waste generated at the site will adhere to municipal by-laws and applicable provincial regulations. • All spills will be reported to the appropriate authority and remediation will be in accordance with applicable regulations (Storage and Handling of Petroleum Products and Allied Products Regulation 188/2001). • Hydrostatic testing will be carried out in accordance with Manitoba Hydro’s EPP for the Project and the <i>Manitoba Natural Gas and Petroleum Liquid Pipeline Hydrostatic Test Discharge Guidelines</i> (MWS 2007). Water from the RM of Montcalm will be used for hydrostatic testing. Testing of the required water chemistry parameters will be completed before and after the hydrostatic testing. Erosion and sediment control measures will be implemented to dissipate the discharged water. All necessary approvals will be obtained prior to discharging test water to road side ditches or to non-cultivated land. There will be no discharges to cultivated land unless approved by the landowner/lessee. • All Project material used at the site will be removed and the area will be restored to the pre-existing appearance. • The construction activities will take place within an existing and new RoW and previously disturbed area for the length of the pipeline, and in a previously disturbed area at the new 4” above grade valve assembly and existing 2” and 3” above grade valve assemblies. The terrain, soils and vegetation that will be affected by the Project consists of flat, cultivated fields, road allowances and drainage ditches that are regularly disturbed by activities related to agriculture, road maintenance, drainage ditch maintenance and wind turbine operation. Based on the field survey, MCDC information and previous environmental studies in the Project area, it is not expected that there are any plant species listed as endangered, threatened or of special concern present within the Project RoW or at the above grade valve assembly locations. • All construction equipment mobilized from outside the construction area shall arrive on the RoW or construction site in clean condition to minimize the risk of weed or pest introduction.

Project Component	Environmental Issue	Mitigation Plans
		<ul style="list-style-type: none"> • Vehicle and equipment access will be limited to the RoW and existing roads and paths wherever possible. • Vehicle traffic on range or pasture land shall be restricted to one-way travel where practicable to minimize disturbance of the sod layer. • Work will be halted under very wet or muddy conditions. • Exhaust and engine systems of equipment and vehicles shall be in good working condition and free of dried grass and other combustibles. • Each construction crew shall carry firefighting equipment. The landowners and authorities having jurisdiction shall be notified immediately should a fire occur. All equipment and personnel shall be made available to control a fire. • Manitoba Hydro will conduct annual maintenance and inspections of the pipeline and new 4" above grade valve assembly to reduce the potential for the occurrence of leaks.
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> • Wildlife species present in the Project area may be temporarily disturbed by noise and activity during the Project construction and/or O&M activities. • Disturbance and/or alteration of terrestrial habitat at the new 4" above grade valve assembly location. 	<ul style="list-style-type: none"> • Implementation of measures outlined in Manitoba Hydro's EPP for the Project. • Compliance with all applicable federal, provincial and municipal legislation, codes and guidelines. • Noise levels will be more concentrated (primarily during construction), but are not expected to exceed noise levels generated by typical agricultural and industrial activities (including traffic) that occur in the area. • It is expected that the wildlife species known to be present or potentially present within the Project area would not be nesting or breeding in the RoW, at the new 4" above grade valve assembly location or at the existing 2" and 3" above grade valve assembly location, and that these species are habituated to the presence of humans and human activity. • The area of habitat that will be disturbed or altered is an 8 m by 8 m area of previously cultivated and/or disturbed land that has low habitat value for most wildlife species.

Project Component	Environmental Issue	Mitigation Plans
Wetlands	<ul style="list-style-type: none"> No effects identified. 	<ul style="list-style-type: none"> None required as there are no wetland areas that will be affected due to the Project.
Groundwater	<ul style="list-style-type: none"> Accidental release of drilling mud and/or drilling mud additives to the Project area if a frac-out (i.e., release of drilling mud) occurs during the directional drilling activities. Accidental release and/or transport of fuel, grease, mud, soil or other deleterious substances to the Project area during the Project construction activities. Accidental release and/or transport of water used for hydrostatic testing. 	<ul style="list-style-type: none"> Implementation of measures outlined in Manitoba Hydro's EPP for the Project, which includes a frac-out contingency plan. The Project does not include any instream works or watercourse crossings. Work will be conducted in accordance with the DFO Manitoba <i>Operational Statement for High Pressure Directional Drilling</i> (Version 3.0). Hydrostatic testing will be carried out in accordance with Manitoba Hydro's EPP for the Project and the <i>Manitoba Natural Gas and Petroleum Liquid Pipeline Hydrostatic Test Discharge Guidelines</i> (MWS 2007). Water from the RM of Montcalm will be used for hydrostatic testing. Testing of the required water chemistry parameters will be completed before and after the hydrostatic testing. Erosion and sediment control measures will be implemented to dissipate the discharged water. All necessary approvals will be obtained prior to discharging test water to road side ditches or to non-cultivated land. There will be no discharges to cultivated land unless approved by the landowner/lessee. Compliance with all applicable federal, provincial and municipal legislation, codes and guidelines. Oil changes, refuelling and lubricating of mobile construction equipment will be conducted a minimum of 100 m from any watercourse. Storage and disposal of dangerous goods will occur according to <i>Workplace Safety and Health Act</i> and <i>Storage and Handling of Petroleum Products and Allied Products Regulation 188/2001</i>. Storage and disposal of all waste generated at the site will adhere to municipal by-laws and applicable provincial regulations. All spills will be reported to the appropriate authority and remediation will be in accordance with applicable regulations (<i>Storage and Handling of Petroleum Products and Allied Products Regulation 188/2001</i>).
Surface Water	<ul style="list-style-type: none"> No effects identified. 	<ul style="list-style-type: none"> None required as there are no surface water areas that will be affected due to the Project.
Fish and Fish Habitat	<ul style="list-style-type: none"> No effects identified. 	<ul style="list-style-type: none"> None required as there are no fish or fish habitat that will be affected due to the Project.
Species at Risk	<ul style="list-style-type: none"> Species at risk present in the Project area may be temporarily disturbed by noise and activity during the Project 	<ul style="list-style-type: none"> Implementation of measures outlined in Manitoba Hydro's EPP for the Project. Compliance with all applicable federal, provincial and municipal legislation, codes and guidelines.

Project Component	Environmental Issue	Mitigation Plans
	<p>construction and/or O&M activities.</p> <ul style="list-style-type: none"> Disturbance and/or alteration of terrestrial habitat at the new 4" above grade valve assembly location. 	<ul style="list-style-type: none"> Noise levels will be more concentrated (primarily during construction), but are not expected to exceed noise levels generated by typical agricultural and industrial activities (including traffic) that occur in the area. The area of habitat that will be disturbed or altered is an 8 m by 8 m area of previously cultivated land that has low habitat value for most wildlife species. Based on the type of habitat available and level of human activity within the Project area, it is not expected that the Project area provides nesting or breeding habitat for any of the identified species at risk; habitat use is likely limited to occasional feeding and movement through the Project area. If nests, burrows or breeding areas for the identified species at risk are discovered during construction activities, construction activities will be halted and appropriate set back distances will be implemented.
Land Use	<ul style="list-style-type: none"> During the Project construction activities, local traffic may need to be periodically rerouted or stopped due to the use and operation of equipment in the Project area. These traffic interruptions are required for the Health and Safety of the public, Manitoba Hydro employees and Manitoba Hydro contractors. This traffic interruption may cause a minor, temporary, localized effect on land use for local residents. The Project O&M activities are not expected to have an effect on land use within the Project area. 	<ul style="list-style-type: none"> Use of the pipeline RoW and new 4" above grade valve assembly location for the Project activities and equipment is an unavoidable component of the proposed Project. These effects will be mitigated by scheduling the works to be conducted on weekdays during daylight hours where feasible, restricting the works to the RoW and notifying affected landowners about the proposed Project in advance of Project start-up and activities. Safety signage and safe work practices will be used at all work areas for the Project as part of site management practices. Notification of the Project activities and schedule to the landowners and RM of Montcalm.
Resource Use	<ul style="list-style-type: none"> During the Project construction activities, local traffic may need to be periodically rerouted or stopped due to the use and operation of equipment in the Project area. These traffic interruptions are required for the Health and Safety of the public, Manitoba Hydro employees and Manitoba Hydro contractors. This traffic interruption may cause a minor, temporary, localized effect on resource use for local 	<ul style="list-style-type: none"> Use of the pipeline RoW and new 4" above grade valve assembly location for the Project activities and equipment is an unavoidable component of the proposed Project. These effects will be mitigated by scheduling the works to be conducted on weekdays during daylight hours where feasible, restricting the works to the RoW and notifying affected landowners about the proposed Project in advance of Project start-up and activities. Safety signage and safe work practices will be used at all work areas for the Project as part of site management practices. Notification of the Project activities and schedule to the landowners and RM of Montcalm.

Project Component	Environmental Issue	Mitigation Plans
	<p>residents.</p> <ul style="list-style-type: none"> The Project O&M activities are not expected to have an effect on resource use within the Project area. 	
Protected Areas	<ul style="list-style-type: none"> No effects identified. 	<ul style="list-style-type: none"> None required as there are no Protected Areas that will be affected due to the Project.
Heritage Resources	<ul style="list-style-type: none"> No effects identified. 	<ul style="list-style-type: none"> None required as there are no Heritage Resources that will be affected due to the Project. Manitoba Hydro's EPP for the Project includes a stop work order in the event that heritage resources are discovered. When archaeological and historic artifacts are uncovered during construction, work at the location will cease immediately, and the discovery will be reported to the Construction Supervisor. The Construction Supervisor will contact the Manitoba Hydro Environmental and Licensing Department for further instructions.
Stakeholder Perspectives	<ul style="list-style-type: none"> Stakeholder issues were identified and addressed through a public engagement program. 	<ul style="list-style-type: none"> The public engagement program indicated that there was strong support amongst the local municipality, landowners and the general public in the Project area. Many viewed the project as having long term potential benefits with some short term potential inconveniences with regards to agricultural operations.
Aboriginal Issues, Concerns and Interests	<ul style="list-style-type: none"> There are no First Nation communities located within the Project area. The Roseau River Anishinabe First Nation is located on the east side of PTH75 about 3 to 5 km from the Project area. Effects on waterways as a result of the project. The Project area is within Métis Natural Resource Harvesting Zone 33. 	<ul style="list-style-type: none"> Manitoba Hydro contacted the Peguis First Nation, Roseau River Anishinabe First Nation and the Manitoba Métis Federation to notify these groups of the Project and solicit any comments, questions or concerns. The three groups were provided with a package of the Project information and invited to attend the Open House. Manitoba Hydro met with a Roseau River Anishinabe First Nation representative to discuss this Project, as well as other potential projects. The Project will not be crossing any waterways. When a pipeline does cross a waterway, Manitoba Hydro uses directional drilling and follows DFO guidelines. Manitoba Hydro continues to endeavour to meet with the Peguis First Nation and Manitoba Métis Federation to discuss this Project, as well as other projects being undertaken by Manitoba Hydro. Based on the wildlife species present or potentially present in the Project area, hunting is likely limited to deer and migrating waterfowl, and trapping is likely limited to coyotes and raccoons. Therefore, it is anticipated that traditional resource activities (e.g., hunting, trapping, fishing, gathering of plants) are not likely being practiced in the Project area.

11. RESIDUAL EFFECTS

11.1. Residual Effects Assessment Criteria

Residual effects are the anticipated effects that are remaining after consideration of the application of all mitigation measures. The significance criteria are based on guidance materials from the Canadian Environmental Assessment Agency. Residual effects of the Project were defined by the following criteria:

Direction – the direction of the effect may be positive, neutral, or negative with respect to beneficial or adverse effects from the Project on the existing environment.

Magnitude – a measure of the degree or intensity of change that can occur as the Project proceeds, which can be low (above background conditions, but within established criteria or scientific threshold and the range of natural variability), medium (substantially above background conditions, but within established criteria or scientific threshold and the range of natural variability), or high (predicted to exceed established criteria or scientific threshold and will likely cause detectable change beyond the range of natural variability).

Geographic extent – refers to the area potentially affected by the effect, whether it is the site (i.e. new 4" above grade valve assembly location, old 2" and 3" above grade valve assembly locations, pipeline RoW and work areas within the RoW), locally (i.e., the Project area), the region (i.e., within 5 km of the Project area) or beyond regional.

Duration – refers to the length of time that the environmental effect occurs and whether the effect is reversible once the disturbance has been completed (i.e., reclamation of disturbed areas). Duration can be short-term, medium-term or long-term. Short-term effects occur only during the construction time period (i.e., less than three months), medium-term effects occur over the entire construction period and extend to the time required for site reclamation (i.e., from one to four months), and a long-term effect implies that the disturbance occurs beyond the time required for completion of construction and site reclamation.

Frequency - refers to the frequency at which the effect occurs over the specified duration and is described as: infrequent (occurs once over the duration of the disturbance), frequent (occurs periodically over the duration of disturbance), or continuous (occurs continuously over the duration of disturbance).

Likelihood – refers to the probability of occurrence (i.e., the risk of an event occurring) and is described as very unlikely, unlikely, likely and very likely.

The activities associated with the proposed Project were first assessed according to the above criteria, and then evaluated together to predict the overall environmental consequence. Environmental consequence was determined as:

Minimal - effects with a low magnitude, short- to medium-term duration, infrequent to continuous occurrence, and are restricted to the proposed Project area in geographic extent.

The potential effect may result in a slight decline in the resource in the Project area during construction phase, but the resource should return to pre-construction levels.

Low - effects with a low magnitude, short- to long-term duration, infrequent to continuous occurrence, and are restricted to the proposed Project area in geographic extent. The potential effect may result in a slight decline in the resource in the Project area during the life of the Project. Research, monitoring, and/or recovery initiatives would not normally be required.

Moderate - effects with a medium magnitude, short- to long-term duration, frequent to continuous occurrence, and extend outside the proposed Project area to adjacent areas. Potential effect could result in a decline in resource to lower-than-baseline but stable levels in the Project area after Project closure and into the foreseeable future. Regional management actions such as research, monitoring, and/or recovery initiatives may be required.

High - refers to major effects that are long-term in duration, continuous in occurrence, and extend outside the proposed Project area to adjacent areas. Potential effect could threaten sustainability of the resource and should be considered a management concern. Research, monitoring, and/or recover initiatives should be considered.

The effect is considered to be significant if the environmental consequence is determined to be moderate or high, and is considered to be not significant if the environmental consequence is determined to be minimal or low.

11.2. Summary of Residual Effects

Residual effects, i.e., the effects that remain after application of mitigation measures, are expected to occur for the following environmental components: air quality and GHG; noise; terrain, soils and vegetation; wildlife and wildlife habitat; groundwater; species at risk; land use; and resource use. The residual effects were assessed in terms of their direction, magnitude, geographic extent, duration, frequency and likelihood as described in Section 12.1. Table 7 provides a summary of the residual effects and assessed environmental consequence of residual effect for each of the environmental components examined in the environmental review and assessment for the Project.

11.3. Environmental Effects Summary

Based on the assessment of the environmental effects that will remain after implementation of the mitigation measures described in Section 11, the residual effects associated with the Project were found to be minimal or low. As such, the environmental effects of the Project are expected to be not significant.

Table 7: Residual Effects and Assessed Environmental Consequence of Residual Effects

Project Component	Predicted Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Likelihood	Environmental Consequence
Air Quality and GHG	<ul style="list-style-type: none"> During the Project construction activities, there will be air emissions due to exhaust and/or dust from the use of stationary and mobile project equipment. 	Negative	Low	Project work areas	Short-term	Frequent	Likely	Minimal
Noise	<ul style="list-style-type: none"> During the Project construction activities, there will be noises emitted by equipment engines. 	Negative	Low	Project work areas	Short-term	Frequent	Likely	Minimal
Climate	None	-	-	-	-	-	-	-
Terrain, Soils and Vegetation	<ul style="list-style-type: none"> Contamination from petroleum spills or release of hazardous materials as a result of accidents and malfunctions that may occur during the Project construction activities. 	Negative	Low	Project work areas	Medium-term	Frequent	Unlikely to Likely	Minimal
	<ul style="list-style-type: none"> Contamination from release of water used for hydrostatic testing. 	Negative	Low	Project work areas	Short-term	Frequent	Unlikely to Likely	Minimal
	<ul style="list-style-type: none"> Disturbance and/or alteration of the soils and vegetation present within the work areas identified in Section 3. 	Negative	Low	Project work areas	Medium-term	Frequent	Likely	Minimal
	<ul style="list-style-type: none"> Introduction of invasive plant species from equipment and vehicles. 	Negative	Low	Project work areas	Medium-term	Frequent	Unlikely to Likely	Minimal

Project Component	Predicted Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Likelihood	Environmental Consequence
	<ul style="list-style-type: none"> Increased potential for wildfires due to the use of gasoline, oil and electronically operated equipment in the Project area 	Negative	Low	Project work areas	Medium-term	Frequent	Unlikely to Likely	Minimal
	<ul style="list-style-type: none"> Release of hazardous materials as a result of accidents and malfunctions that may occur during the Project O&M activities. 	Negative	Low	Project work areas	Long-term	Frequent	Unlikely to Likely	Low
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> Wildlife species present in the Project area may be temporarily disturbed by noise and activity during the Project construction and/or O&M activities. 	Negative	Low	Project work areas	Medium-term	Frequent	Unlikely to Likely	Minimal
	<ul style="list-style-type: none"> Disturbance and/or alteration of terrestrial habitat at the new 4" above grade valve assembly location. 	Negative	Low	Project work areas	Medium-term	Frequent	Unlikely to Likely	Minimal
Wetlands	None	-	-	-	-	-	-	-
Groundwater	<ul style="list-style-type: none"> Accidental release of drilling mud and/or drilling mud additives to the Project area if a frac-out (i.e., release of drilling mud) occurs during the directional drilling activities. 	Negative	Low	Project work areas	Short-term	Frequent	Unlikely to Likely	Minimal

Project Component	Predicted Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Likelihood	Environmental Consequence
	<ul style="list-style-type: none"> Accidental release and/or transport of fuel, grease, mud, soil or other deleterious substances to the Project area during the Project construction activities. Accidental release and/or transport of water used for hydrostatic testing. 	Negative	Low	Project work areas	Short-term	Frequent	Unlikely to Likely	Minimal
Surface Water, Fish and Fish Habitat	None	-	-	-	-	-	-	-
Species At Risk	<ul style="list-style-type: none"> Species at risk present in the Project area may be temporarily disturbed by noise and activity during the Project construction and/or O&M activities. 	Negative	Low	Project work areas	Medium-term	Frequent	Unlikely to Likely	Minimal
	<ul style="list-style-type: none"> Disturbance and/or alteration of terrestrial habitat at the new 4" above grade valve assembly location. 	Negative	Low	Project work areas	Medium-term	Frequent	Unlikely to Likely	Minimal
Land Use	<ul style="list-style-type: none"> During the Project construction activities, local traffic may need to be periodically rerouted or stopped due to the use and operation of equipment in the RoW and at the new 4" above grade valve assembly location. 	Negative	Low	Project work areas	Short-term	Frequent	Unlikely to Likely	Minimal

Project Component	Predicted Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Likelihood	Environmental Consequence
Resource Use	<ul style="list-style-type: none"> During the Project construction activities, local traffic may need to be periodically rerouted or stopped due to the use and operation of equipment in the RoW and at the new 4" above grade valve assembly location. 	Negative	Low	Project work areas	Short-term	Frequent	Unlikely to Likely	Minimal
Protected Areas	None	-	-	-	-	-	-	-
Heritage Resources	None	-	-	-	-	-	-	-

12. CUMULATIVE EFFECTS ASSESSMENT

The cumulative effects assessment (CEA) considered the potential cumulative effect of the residual effects of the Project in combination with the environmental effects of past, present or reasonably foreseeable future projects or activities within the vicinity of the Project study area. Past projects considered for the CEA included the agricultural, commercial, recreational, rural and urban development that has occurred within and adjacent to the Project area, including the St. Joseph Wind Farm. Existing projects considered for the CEA included the St. Joseph Wind Farm. Foreseeable future projects considered for the CEA included Manitoba Hydro's St. Vital to Letellier Transmission Project, Manitoba Hydro's Great Northern Transmission Line Project, and MIT's Pembina-Emerson Point of Entry (POE) Transportation Study project.

Past projects and activities within the Project study area have resulted in a combination of mostly agricultural lands with small areas of industry, recreation, transportation and rural and urban developments. The Project area consists of flat, cultivated fields, road allowances and drainage ditches that have been previously disturbed by activities related to agriculture, pipeline maintenance, road maintenance, drainage ditch maintenance and wind turbine operation. There are very few, if any, areas of undisturbed habitat located within the Project area. Based on the past projects and activities within the Project area and the residual effects found for the Project, the residual effects of the Project are not expected to have a significant interaction with the air quality, GHGs, noise, terrain, soils, vegetation, wildlife, wildlife habitat, groundwater, species at risk, landuse, resource use or stakeholder effects found in the Project area due to the past projects and activities within the Project area.

The St. Joseph Wind Farm was constructed in 2010 and has been in operation since 2011. A large portion of the Project area is located within the agricultural fields of the St. Joseph Wind Farm project. The residual effects of the St. Joseph Wind Farm are related to the land area altered or lost due to placement of the wind turbines and other infrastructure, and the potential aerial effects such as bat, bird and butterfly strikes, noise effects and visual effects. The residual effects of the Project do not include a loss of land area or habitat, aerial effects on wildlife, or permanent effects to noise or the visual landscape. As such, the residual effects of the Project are not expected to have a significant interaction with the air quality, GHGs, noise, terrain, soils, vegetation, wildlife, wildlife habitat, groundwater, species at risk, landuse, resource use or stakeholder effects found in the Project area due to the operation and maintenance of the St. Joseph Wind Farm within the Project area.

Manitoba Hydro's St. Vital to Letellier Transmission Project will include the construction of a new 125 km 230 kV transmission line from the St. Vital Station to the Letellier Station to address contingency loading and low voltage concerns in the south central area of Manitoba. The proposed in-service date for the St. Vital to Letellier Transmission Project is August 2016. The proposed construction schedule for the Project is June 17, 2013 to August 15, 2013, with site restoration and clean up proposed to occur between August 16, 2013 and August 30, 2013. It is expected that the St. Vital to Letellier Transmission Project will use existing infrastructure and RoWs wherever possible. Based on the schedule, location and activities associated with the construction and operation of the St. Vital to Letellier Transmission Project and the residual

effects found for the Project, the construction and operation of the St. Vital to Letellier Transmission Project is not expected to interact with the residual effects found for the Project.

Manitoba Hydro's Great Northern Transmission Line Project would run from the Manitoba-United States border to the Mesabi Iron Range near Duluth, Minnesota. The project is currently in the planning stage with a proposed in-service date of 2020. The proposed construction schedule for the Project is June 17, 2013 to August 15, 2013, with site restoration and clean up proposed to occur between August 16, 2013 and August 30, 2013. It is expected that the Great Northern Transmission Line Project will use existing infrastructure and RoWs wherever possible. Based on the schedule, location and activities associated with the construction and operation of the Great Northern Transmission Line Project and the residual effects found for the Project, the construction and operation of the Great Northern Transmission Line Project is not expected to interact with the residual effects found for the Project.

The functional design for MIT's Pembina-Emerson Point of Entry (POE) Transportation Study project is scheduled to be completed in October 2013. The study area encompasses a 3.2 km wide transportation and land use corridor between Exit 215 on Interstate 29 at Pembina, North Dakota (3.6 km south of the border) to the PTH 75 / PR 243 intersection north of Emerson, Manitoba (1.6 km north of the border). Construction is proposed to begin in 2015 and be completed by 2017. The construction activities for the POE project will be located about 15 km southeast of the Project area. Based on the schedule, location and activities associated with the construction and operation of the POE Project and the residual effects found for the Project, the construction and operation of the POE Project is not expected to interact with the residual effects found for the Project.

13. MONITORING AND FOLLOW-UP ACTIVITIES

13.1. Construction Monitoring

Manitoba Hydro's Environmental Protection Program for this project will include field inspections during construction, adherence to all applicable federal, provincial and municipal acts and regulations, and adherence to the environmental protection provisions outlined in the Project EPP. The Manitoba Hydro Construction Field Supervisor will act as the environmental inspector for this Project. The Manitoba Hydro Construction Field Supervisor will be responsible for performing inspections of the work site and documenting any deficiencies noted in the environmental protection measures in the inspection reports. The Manitoba Hydro Construction Field Supervisor will inspect the site routinely to ensure that the site is managed in accordance with the construction documentation and the project EPP.

13.2. Drilling Plan and Frac-out Contingency Plan

In addition to construction monitoring, the EPP for the Project will include a drilling plan and a frac-out (i.e., release of drilling fluids or mud during the drilling activities) contingency plan. There are no watercourse crossings for the Project, but directional drilling will be used at all road crossings or other sensitive areas as discussed in Section 3.

13.2.1. Drilling Plan

The drilling plan will include but not be limited to the following:

- The contractor must submit a written directional drilling execution plan that meets or exceeds the requirements of CSA Z662, current edition, prior to conducting any construction work within 100 metres of a watercourse.
- The submission must include but is not limited to:
 - Workspace requirements for equipment at entry and exit points
 - Workspace requirements to construct and lay-out the pipeline drag section
 - Drilling mud and water requirements
 - Environmental protection and monitoring plan
 - Drilling fluid management plan (trucking, tanks, pits, etc.)
 - Spill or fluid loss contingency, response, clean-up and mitigation plans
 - Equipment specifications, condition and integrity
 - Mitigation of potential detrimental effects of geological formations
- The contractor must use the approved Manitoba Hydro “*Horizontal Directional Drilling Execution Plan*” or other format as approved by the Project engineer.

13.2.2. Frac-out Contingency Plan

The frac-out contingency plan will include but not be limited to the following:

- The materials and equipment needed to contain and clean-up a frac-out will be available on site during the directional drilling activities, e.g., vacuum truck, large-diameter stand pipe, turbidity barriers, silt fencing, hay bales, plastic sheeting, shovels, pails, push brooms, squeegees, pumps and hose, mud storage containers.
- If an abnormal loss of fluid, drop in pressure, or visible plume is observed indicating a frac-out or possible frac-out, drilling is to stop immediately and appropriate containment measures as needed to contain and recover the lost drilling fluids will be carried out as follows:
 - Where conditions warrant and permit (i.e., readily accessible by a vacuum truck, shallow depth, clear water, not a potentially sensitive habitat, and low water velocity) and where a frac-out has been visually detected, attempts will be made to isolate the fluid release using a large diameter stand-pipe such as a 45 gallon drum with both ends cut out, or a short piece of culvert.
 - If the frac-out occurs on ground it shall be contained using appropriate methods as proposed by the contractor.
- The contractor will inform the Manitoba Hydro construction supervisor of the frac-out condition or potential condition, and jointly decide on the appropriate action as follows:
 - Assign a person to monitor (visual or using a turbidity meter) for the presence of a muddy plume;

- Make adjustments to the mud mixture (e.g., add lost circulation material to the drilling fluid in an attempt to prevent further loss of fluid to the ground formation and/or the watercourse);
- Prior to commencing any pumping to deliver the lost circulation material to plug the fracture, have the vacuum truck in position to recover any fluids that otherwise may escape to the watercourse.
- The Manitoba Hydro construction supervisor will make the final decision on the next course of action, but the discussions will be a joint effort between the contractor and Manitoba Hydro.
 - Under circumstances where a frac-out has occurred, has been confirmed visually, and where conditions do not permit containment and the prevention of drilling fluids release to the ground formation and/or the watercourse, attempts to plug the fracture by pumping lost circulation material are not to continue for more than 10 minutes of pumping time.
 - If the frac-out is not contained within this time, the Manitoba Hydro construction supervisor will halt any further attempts until a course of action (either abandon directional drilling or continue following consultation with the Manitoba Hydro Project engineer) is decided upon.
- Any recovered drilling fluids will be recycled or disposed of at a stable upland location at least 100 m from any wetland, watercourse or waterbody or at a disposal facility.

13.3. Post-Construction Monitoring

The work areas for the Project will be examined by an environmental inspector after completion of the Project activities to ensure that the measures outlined in the Project EPP were followed and any areas disturbed by the Project were restored to pre-construction conditions.

14. EFFECT OF THE ENVIRONMENT ON THE PROJECT

The effects of the environment on the project were identified as:

- existing condition and use of the landbase in the project area, i.e., the majority of the land is currently used for agriculture;
- existing runoff and flooding conditions, i.e. seasonal changes in runoff, meltwater and areas of inundation; and
- seasonal changes in climate that affect access to and development of the landbase.

These effects have been addressed by:

- consideration of the condition and use of the landbase in the project planning and design;
- planning and design of the project to incorporate existing runoff, flooding and climatic conditions; and

- incorporation of the necessary environmental protection measures into project planning and design, including erosion and sediment control planning, salvage of soils and vegetation, and water protection and management.

As such, the environment is not expected to have any effect on the proposed Project.

15. SIGNIFICANCE OF EFFECTS AND CUMULATIVE EFFECTS

The potential environmental effects of the Project are expected to be not significant. The potential environmental effects can be minimized or prevented through the use of mitigation measures, adherence to the Manitoba Hydro EPP for the Project and compliance with applicable municipal, provincial and federal environmental regulations, guidelines and/or policies. The residual effects of the Project are not expected to significantly interact with the environmental effects of past, present or reasonably foreseeable future projects or activities within the vicinity of the Project study area. Therefore, there were no cumulative effects identified for the proposed Project.

16. CLOSURE

We trust that the above information meets your present requirements. If you have any questions or require additional details, please contact the undersigned.

Best regards,



Maureen Forster, M.Sc., EP

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Appendix A: Preliminary Design Drawings