St. Vital Transmission Project

(Y36V)

St. Vital to Laverendrye Transmission Line

Environmental Protection Plan

June 2022

Prepared by Manitoba Hydro

Transmission & Distribution Environment and Engagement Department

Project Management Division

Manitoba Hydro

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Preface

Manitoba Hydro's environmental commitment

Manitoba Hydro is committed to protect and preserve natural environments and heritage resources affected by its projects and facilities. This commitment and a commitment to continually improve environmental performance is demonstrated through the company's Environmental Management System, which is ISO 14001 certified.

Environmental protection can only be achieved with the engagement of Manitoba Hydro employees, consultants, local communities 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 by:

- Preventing or minimizing any adverse impacts on the environment, and enhancing positive impacts
- Continually improving our Environmental Management System
- Meeting compliance obligations
- Considering the interests and recognizing the knowledge of our interested parties who may be affected by our actions
- Reviewing our environmental objectives and targets regularly to ensure improvement in our environmental performance
- Documenting and reporting our activities and environmental performance"

Manitoba Hydro's Environmental Management Policy has been used to guide the development of the Environmental Protection Program for the proposed project. Implementation of the program is practical application of the policy and will demonstrate Manitoba Hydro's dedication to environmental stewardship.

Adaptive management is being implemented within the Environmental Protection Program to be responsive and adaptive to changes to the project and on the landscape, stakeholder and aboriginal concerns, as well as inputs from our inspection and monitoring programs.

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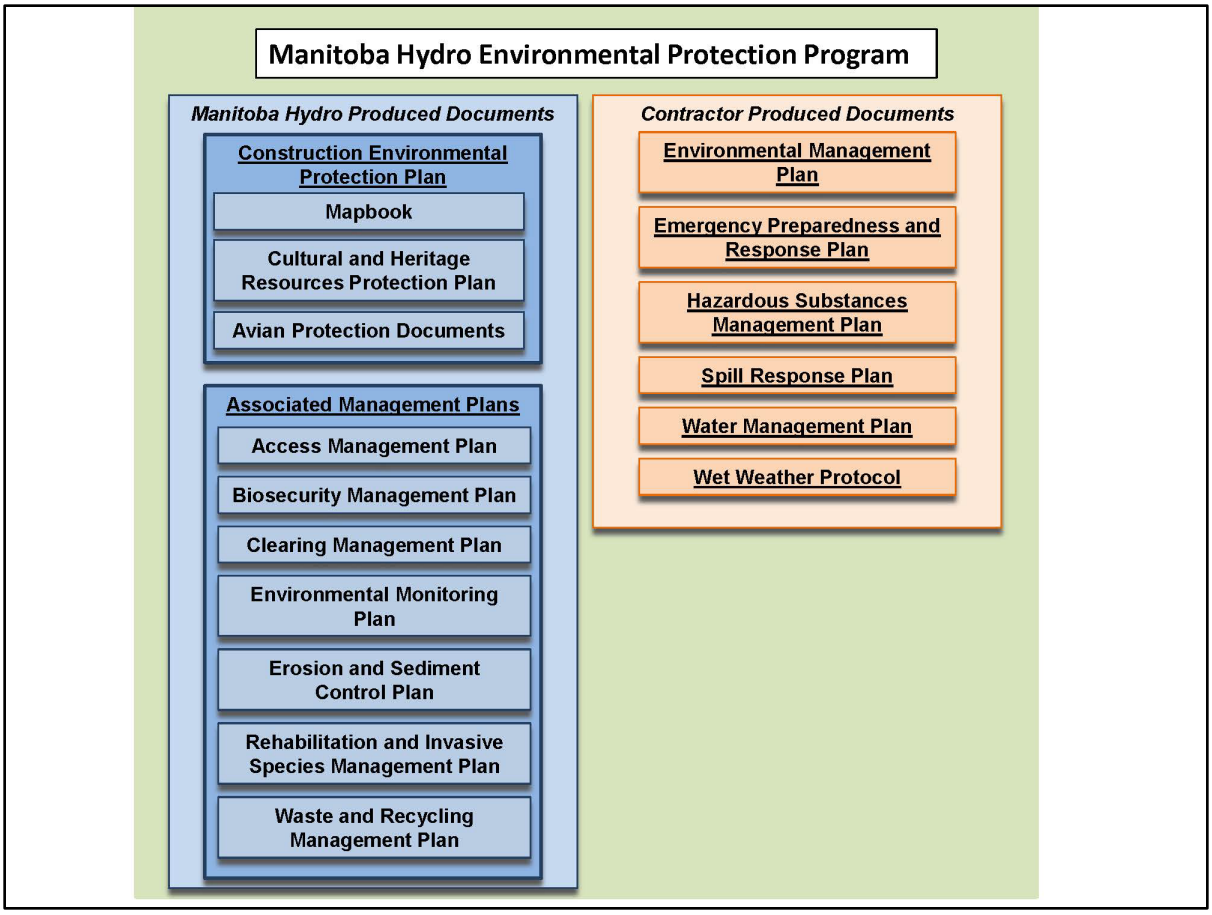

Figure 1: Diagram of environmental protection documents

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Document Owner
Transmission & Distribution Environment and Engagement Department
Project Management Division
Manitoba Hydro

Version – Final 1.0

List of Revisions

NUMBER	NATURE OF REVISION	SECTION(S)	REVISED BY	DATE

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1.0 Introduction

The purpose of this construction environmental protection plan (CEnvPP) is to provide information that will guide contractors and field personnel while constructing the St. Vital transmission project (the 'Project') in a manner that meets environmental legislation requirements and protects the environment. The activities and areas associated with the Project are as described in this CEnvPP, the associated management plans and the environmental assessment report. Generally this includes rights of ways, transmission lines, stations, access routes, marshalling yards, and any other ancillary works and temporary workspaces developed for the sole purpose of constructing the project. The CEnvPP outlines the commitments and efforts that will be taken by Manitoba Hydro (MH) and contractors to protect the environment and mitigate potential environmental effects that may occur during construction of the Project. The use of environmental protection plans is a practical and direct implementation of Manitoba Hydro's commitment to responsible environmental stewardship.

This CEnvPP provides guidance for the implementation of environmental protection measures for the Project. The direction and guidance provided in this CEnvPP document applies to all lands related to the project both private land and crown land. The Project includes the construction of a 230-kV transmission line (Y36V) from St. Vital to Laverendrye Transmission Line.

This document provides general and specific mitigation measures to reduce the potential for environmental effects that may occur during the Project's construction phase. It is designed to be a resourceful, user-friendly tool to guide onsite implementation of environmental protection measures. This document provides contractors and field personnel guidance on the implementation of environmental protection measures. Where contractors have experience using other federally or provincially accepted methods of environmental protection, they are encouraged to discuss with the MH environmental officer / inspector.

Map 1: Overview map of the St. Vital transmission project

FINAL 1.0 June 17, 2022

Manitoba Hydro

St. Vital Transmission Complex

Project Infrastructure

- Y36V Final Preferred Route

Infrastructure

- Electrical Station
- Existing ≥230kV Transmission Line
- Existing ≥69kV Transmission Line

Landbase

- Community
- Highway
- Major Road
- Local Road
- City
- First Nation Lands
- Provincial Park
- Rural Municipality

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: May 17, 2022

N

0 1.5 Kilometres
0 0.75 1.5 Miles

1:90,000

Y36V Transmission Line Overview

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1.1 Document amendment process

To communicate the most up to date and current versions of environmental protection documents an amendment process has been established. This amendment process applies to both text (Part 1) and mapping (Part 2) documents. Throughout construction there will be changes and revisions to documents, these revisions are a result of errors and omissions or due to the ongoing adaptive management process to improve environmental protection measures. In addition, Manitoba Hydro's Transmission & Distribution Environment and Engagement department must approve all field decisions and/or changes to a procedure outlined in the CEnvPP. Should an amendment be required, it will be communicated to Manitoba Environment, Climate, and Parks (MECP) through the Environmental Approvals Branch to determine approval requirements. Figure 2 illustrates the document amendment process, including loading amendments into the Environmental Protection Information Management System (EPIMS) so that users are notified of changes and the amendments can be distributed to them through Manitoba Hydro staff.

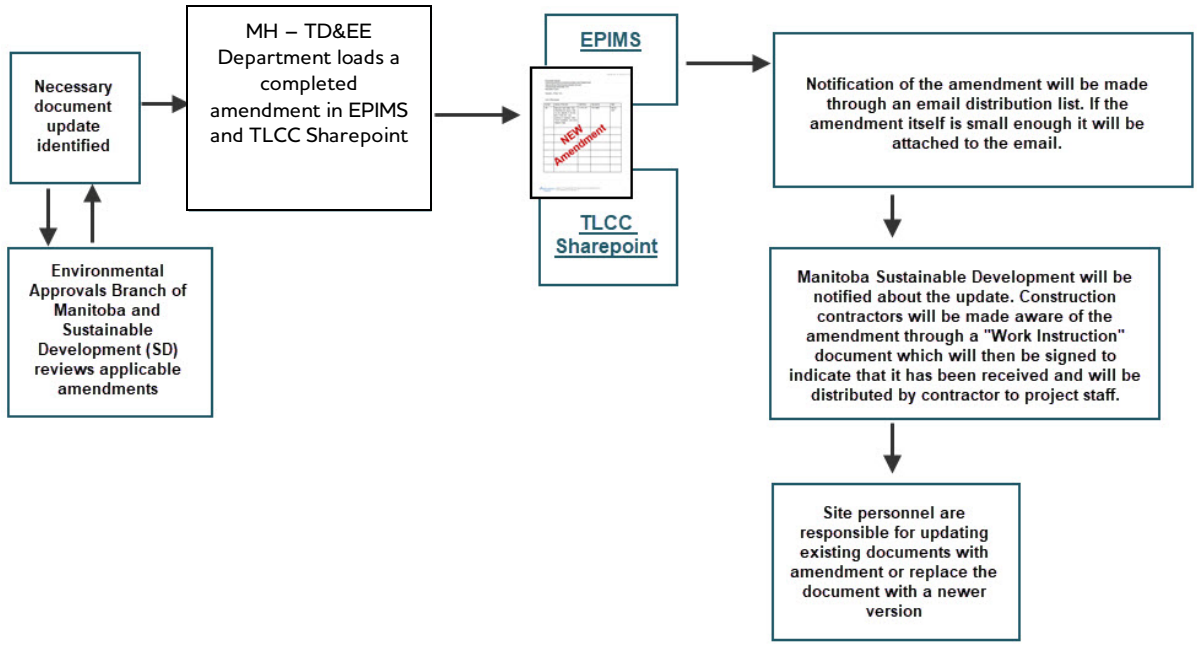

Figure 2: Document amendment process

1.2 Overview of the Environmental Protection Plan

Part of Manitoba Hydro's commitment to environmental protection includes a comprehensive Environmental Protection Program. This program includes the development of a CEnvPPs specific to the Project. The CEnvPP provide general and specific environmental protection information for project components and is intended for use by construction contractors and environmental staff.

A number of environmentally sensitive sites (ESS) have been identified for the Project. ESS are locations, features, areas, activities or facilities that were identified in the Project environmental impact statement to be ecologically, socially, economically, culturally or spiritually important or sensitive to disturbance and require protection during construction of the project. The determination of ESS has included the consideration of Indigenous traditional knowledge. Manitoba Hydro will continue to engage with stakeholders and indigenous communities in efforts to continually update this plan with sensitive sites and current knowledge as it is shared.

Map sheets have been developed for the Project to present the location and spatial extent of ESS. Each map has corresponding tabular summary information including ESS feature information and relevant mitigation measures to address the potential environmental effects at each ESS site.

1.3 Roles, responsibilities and reporting

This section outlines the major roles and responsibilities of those involved in the implementation of the CEnvPP for the transmission components of the Project which includes both the Transmission & Distribution Environment and Engagement (TD&EE) and Transmission Line and Civil Construction (TLCC) departments. A summary of roles and key responsibilities is found in Table 1. Communication and reporting on environmental issues, monitoring and compliance will be as outlined in Figure 3. A contact list for key staff involved in supporting this CEnvPP is found in Appendix A.

Table 1: Environmental roles and responsibilities

Role	Key responsibilities
MH project engineer (TLCC)	• Monitor quality control issues on the project. • Issues environmental improvement and stop work orders to Contractor as required for non-compliance issues • Participates with Senior Environmental Assessment Officer (TD&EE) in Manitoba Sustainable Development Regional Integrated Resource Management Team meetings. • Responds to Environmental Non-Compliance Advisements with plan of action to correct non-compliances
MH senior environmental assessment officer (TD&EE)	• Provides advice and guidance on environmental protection matters • Monitors inspection reports and monitoring information, and prepares annual report as per regulatory requirements • Issues environmental improvement and stop work orders as required for non-compliance issues • Participates in Contractor Environmental Pre-Job Orientation and Contractor Environmental Representative Pre-job Meeting • Liaises with Manitoba Sustainable Development, Environmental Approvals Branch

Role	Key responsibilities
MH environmental specialist (TD&EE)	• Assists MH Environmental Officer in developing solutions for environmental issues with the Construction Supervisor and the Contractor. • Assist Project Engineer in responding to Environmental Non-Compliance Advisements from TD&EE with plan of action to correct non-compliances. • Prepare and advise on issuance of Environmental Stop Work Orders and Environmental Improvement Orders • Responsible for tracking all construction related landowner commitments and customer complaint and reported on in the monthly environment construction progress report • Manages MH and Contractor spill response, clean-up, testing, follow-up and reporting • Obtain from contractor any permits and approvals including private landowner agreements (i.e. marshalling yards, camps) and load into MH Permit Tracking system • Review contractor documentation that is required to be submitted as per environmental protection and management plans, pass on any action items to Environmental Officer and MH Field Engineer- ie. Biosecurity report (records of cleaning) Spill and clean up reports, environmental inspection reports and ensure loaded into EPIMS • Participates in Contractor Environmental Pre-Job Orientation and Contractor Environmental Representative Pre-job Meeting

Role	Key responsibilities
MH environmental officer (TD&EE)	• The Environmental Officer reports to the Senior Environmental Assessment Officer and provides advice and guidance to the Construction Supervisor/Field Engineer • Manages Environmental Inspectors in the field • Provides support and guidance in developing solutions for environmental issues on-site with the Construction Supervisor/Field Engineer and the Contractor and where applicable with the input from the Senior Environmental Assessment Officer • Provide in-field landowner liaison support • Provides support and guidance to the Contractor regarding CEnvPP • Participates in Contractor Environmental Representative Pre-job Meeting and in Contractor Environmental Pre-Job Orientation • Assists the Contractor's Environmental Representative in ensuring that all necessary information is covered in the Contractors pre-job employee orientation and record is kept. • Provides advice and guidance to the Construction Supervisor for non-compliance situations, environmental incidents and emergencies. • Conducts site inspections regularly and ensures that reports containing information on activities carried out as well as effectiveness of actions and outstanding issues are submitted to Environmental Protection Information Management System • Prescribes follow-up mitigation measures and ensures that they are implemented. • Confirms that all ESS sites are correctly identified, delineated and flagged/marked by the Construction Contractor in the field • Monitors the project for compliance of the CEnvPP, Environmental License and other environmental regulatory requirements • Responsible for ongoing compliance monitoring of project activities to ensure consistent implementation of the CEnvPP and accurate reporting into the Environmental Protection Information Management System • Liaises with regional regulatory authorities and other regulatory authorities where required or applicable

Role	Key responsibilities
MH Field Engineer (TLCC)	• Monitor, track and prepare report on construction progress; • Issue Work Instructions , Variations and Non-Conformance Reports as required • Assist in chairing progress meetings • Review and provide comments on Contractors reports, plans, schedules etc. • Ensure compliance of all contractual requirements • Responds to Environmental Non-Compliance Advisements with plan of action to correct non-compliances
MH construction supervisor(s) (TLCC)	• Supervise construction inspectors • Arrange safety orientations with the Contractor for MH/Consultant staff/visitors. • Responsible for implementation of all construction related landowner commitments • Responsible for rectifying construction related Customer Complaints • Conduct regular site visits to identify any issues related to construction, safety and environment • Facilitates construction contractors implementation of remedial actions or responses to non-conformance situations or incidents are implemented as required • Works with the MH environmental specialist(s), Senior Environmental Assessment Officer and Environmental Officer/Inspector to ensure implementation of environmental protection measure

Role	Key responsibilities
Construction Inspectors / Engineering Technicians (TLCC)	• Review all drawings and understand the technical specifications for the assigned work. • Ensure the contractor is performing the work as per the drawings and technical specifications, and Environmental Protection Plans. • Monitor and report daily construction progress • Report any safety, environment, quality, material, design and any other construction related concerns to the construction supervisor and field engineer • Work collaboratively with Environmental Officer/Inspector to identify ESS site, ensure all ESS sites are correctly delineated and flagged/marked in the field locations and ensure that prescribed mitigation is being implemented and meeting regulatory requirements.
Construction contractor(s) (project manager / construction supervisor)	• Accountable for all regulatory and environmental prescriptions (i.e., follow CEnvPP and mitigation measures prescribed) • Ensure all contractor project staff are adequately trained/informed of pertinent environmental requirements of the Project related to their position • Report any discoveries of non-compliance, accidents or incidents to the construction supervisor and environmental officer / inspector • Ensure that all remedial actions are carried out as per Manitoba Hydro instruction • Ensure all discoveries of heritage resources, human remains, paleontological finds, environmentally sensitive sites, etc. are reported to the construction supervisor and environmental officer / inspector • Responsible for other permits as outlined in the “Environmental Licences, approvals and permits” table (In Appendix B). • Responsible for providing an Annual Environmental Report summarizing work activities and events as they pertain to environmental protection compliance.

Role	Key responsibilities
Construction contractor staff	• Accountable for all regulatory and environmental prescriptions (i.e., follow CEnvPP and mitigation measures prescribed). • Ensure adequately trained with respect to, and informed of pertinent, environmental requirements of the Project related to their position. • Report any discoveries of non-compliance, accidents or incidents to the construction supervisor and environmental officer / inspector. • Ensures that all remedial actions are carried out as per Manitoba Hydro instruction. • Ensures all discoveries of heritage resources, human remains, paleontological finds, environmentally sensitive sites, etc. are reported to the construction supervisor and environmental officer / inspector.
Construction contractor's environmental representative	• Must possess a post secondary education in an environmental or resource management discipline with minimum of 2 years relevant experience. • Responsible for implementation, coordination and verification of pre-project employee environmental orientation. • Ensures that the contractor employees adhere to all aspects of the CEnvPP. • Provides information and advice to the construction contractor employees on environmental protection matters. • Responsible for implementation of the emergency response and hazardous materials plans, and other related topics. • Liaises with MH environmental officer / inspector and MH field safety officers. • Delineate and flag/sign all environmentally sensitive sites as identified in CEnvPP in the field as per flagging and signage standards. • Identify, delineate and flag or mark all access, ROW and other applicable boundaries in the field. • Identify any previously unknown ESS to MH environmental officer / inspector

1.3.1 Environmental protection

Manitoba Hydro will provide copies of all available permits, licences, approvals and authorizations obtained for the Project to the contractor. Prior to commencing associated work the contractor will provide Manitoba Hydro with copies of all available permits, licences, approvals and authorizations obtained for the Project. Electronic copies of all permits are available for download from EPIMS.

The contractor will comply with the CEnvPP prepared for the Project, including mitigation measures identified during the environmental assessment and contained herein. Environmental aspects of the work including applicable licence/permit conditions will be discussed during the environmental pre-job orientation, weekly progress meetings, and daily job planning meetings.

Without limiting or otherwise affecting the generality or application of any other term or condition of the contract, the contractor shall:

- Strictly comply with all environmental Legislation and have suitable corrective and/or preventive measures in place to address any previous environmental warnings, fines or convictions; issued by regulatory agencies and/or Manitoba Hydro
- Do or cause to be done all things required or ordered, to mitigate environmental damage caused, directly or indirectly, by itself or by its servants, agents, employees or subcontractors, accidentally or as a result of practices that are in contravention of the contract or any environmental legislation

1.3.2 Documentation and Reporting

There is a requirement for the Contractor to provide reports and documentation to Manitoba Hydro in an acceptable digital format. Manitoba Hydro during Pre-Job Orientation will provide a list of all reporting and documentation submission requirements, timelines for submission, acceptable digital formats, and method of transmittal. (e.g. EPIMS, Project Sharepoint Site, email, FTP).

Examples of reports and documents that are required for the project are listed below (not an exhaustive list): Annual or post construction Environmental Reports

- Weekly Environmental Monitoring Reports

- Spill reports
- Bird Survey forms
- Amphibian Survey forms
- Landowner permission forms
- Biosecurity forms (more information provided in management plan)
- Timber scaling records and copies of load slips (more information provided in management plan)
- Copies of all permits and approvals acquired by the contractor
- Copies of any contractor developed plans such as emergency response and hazardous materials plans
- Environmentally related incident reports

1.3.3 Environmental representative(s) / supervisor(s)

Before commencing the on-site work, the contractor shall identify its dedicated on-site representative(s) / supervisor(s), who shall attend the pre-job meeting (environmental component) to review environmental matters for the work. The dedicated on-site contractor environmental representative(s) / supervisor(s) shall be fully conversant with:

- Contractor's environmental practices and policies
- All applicable environmental legislation
- Mitigation measures outlined in the CEnvPP

The contractor will ensure a sufficient number of environmental representatives are in place to fulfill the commitments of the Project's environmental protection and management plans, and any associated licence conditions associated with the Project. Manitoba Hydro and the Contractor will jointly determine the resources required through criteria composed of a variety of factors including construction schedules, number of sub-contractors, division of construction segments, phase of construction, season, and the nature of the licence conditions.

1.3.4 Environmental improvement orders

Failure to comply with the environmental protection section above or unsatisfactory performance in regards to any other environmental-related matter may result in Manitoba Hydro issuing environmental improvement orders to the contractor.

The environmental improvement order, once communicated verbally or in writing is considered “effective immediately”. Manitoba Hydro will establish a compliance date for each environmental improvement order issued. The contractor must provide written documentation of the actions taken regarding the environmental improvement order as follows:

The contractor shall:

- Prepare a written report on the measures taken to remedy the contravention and on any measures yet to be taken within the expiry date of the period specified in the order or any extension thereof ,
- Send a copy of the report to the Manitoba Hydro representative who made the order as well as all individuals cc’d on the transmittal document
- Provide a copy of the report to the employee(s) involved, if applicable,
- Review the contravention with all employees at a regular weekly meeting and post in a prominent place at or near the worksite

1.3.5 Environmental stop work order

Manitoba Hydro may issue an environmental stop work order where any activities which are being, or are about to be, carried on at a worksite, involve or are likely to involve an imminent risk of serious impact to the environment, or where a contravention specified in an environmental improvement order was not remedied and warning was given. The environmental stop work order, once communicated, verbally or in writing is considered “effective immediately”, for any one or more of the following matters:

- The cessation of those activities
- That all or part of the worksite be vacated
- That no resumption of those activities be permitted by the contractor
- That a Manitoba Hydro issued stop work order remains in effect until it is withdrawn in writing by Manitoba Hydro
- That Manitoba Hydro will not be held responsible for delays to the work or be required to compensate the contractor for any matters arising as a result of the Manitoba Hydro issued environmental stop work order

Note: A Manitoba Hydro-issued environmental stop work order does not prevent the contractor from completing any work or activity that may be necessary in order to remove the risk of injury referred to above.

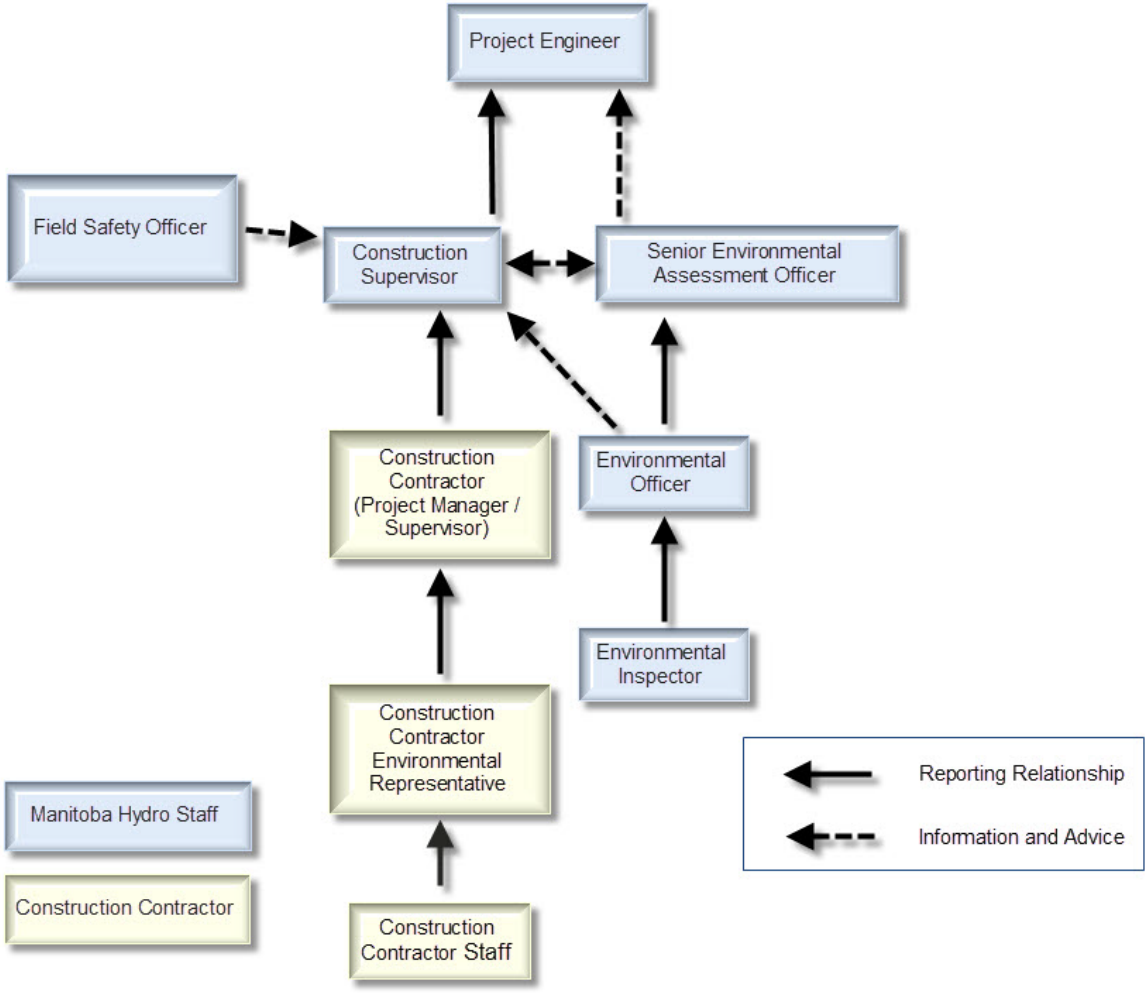

Figure 3: Environmental communication reporting structure

1.4 Environmental protection information management system

EPIMS will provide a single interface to store all environmental documentation. It will be utilized by project staff to submit permits, inspection reports, plans, logs, checklists, etc. for the management of all environmental protection implementation, regulatory compliance and incident reporting. The EPIMS will be developed by Manitoba Hydro

and be fully integrated with project communications, inspection, biophysical, socio-economic, and heritage monitoring.

1.5 Regulatory requirements

All relevant regulatory approvals for the Project will be obtained by Manitoba Hydro prior to construction. All documentation will be kept on-site by both the contractor and Manitoba Hydro personnel. Manitoba Hydro requires that its employees and contractors comply with all federal and provincial regulatory requirements relating to the construction, operations and decommissioning of its projects and facilities. All Project licences, approvals and permits obtained can be found in Appendix B

2.0 Environmental considerations

Important environmental considerations for pre-construction planning and construction activities are required at environmental sensitive sites (ESS), which include locations, features, areas, activities or facilities that were identified in the Project environmental impact statement to be ecologically, socially, economically or culturally important or sensitive to disturbance. These ESS require protection and mitigation during construction. ESS include riparian areas, valued and protected vegetation, wildlife and habitats, cultural (heritage/archaeological and spiritual sites), unique terrain features, erosion and compaction prone soils and other important locations requiring specific protection (e.g., resource use, access).

2.1 Timing windows

2.1.1 Wildlife

The "Timing windows" table found in Appendix C outlines wildlife reduced risk work windows applicable to the Project. These windows are based on federal and provincial regulatory requirements as well as best management practices. Timing periods may be expanded or refined based on further data collection, transmission line final design and regulatory license and work permits to be issued for the project.
The recommended reduced risk timing windows table demonstrates periods of the year when wildlife species are sensitive to disruptive operations because of a sensitive lifecycle activity such as calving, nesting, and hibernation, etc. The "Timing windows table (In Appendix C) is intended to assist in scheduling construction activities for the time of year when risks of adverse construction impacts are negligible. Where conflicting timing restraints with construction activities exist in a particular area, appropriate mitigation will be implemented to reduce effects.

2.1.2 Burning

Between November 16th to March 31st there is no requirement for a burning permit under the *Wildfires Act*. If burning is required outside of those dates (i.e. between April 1st and November 15th) a burning permit application is made to the local Manitoba Sustainable Development district office. A copy of the burning permit must be on hand at all times while burning. All fires must be completely extinguished by March 15th.

2.1.3 Fish

Fish habitat can be adversely affected by in-stream work (none currently planned) that occurs during certain periods in their life history or at certain life stages. Life history periods or life stages susceptible to disturbances from in-stream construction work include the following:

- Spawning and egg incubation
- Movements to or from spawning or overwintering areas
- Egg and newly hatched fry

Timing works to avoid sensitive life history periods or life stages is an effective means of mitigating adverse effects. The “Timing windows” table (In Appendix C) contains general timing windows to avoid during construction.

2.2 Setbacks and buffers

Setbacks and buffer distances from sensitive environmental features are provided in a “Buffers and setbacks” table, found in Appendix D.

These setback and buffers may be expanded or refined based on further data collection, transmission line final design, regulatory license and work permits to be issued for the project.

Setbacks are areas to be maintained from a given environmental feature where no work shall occur unless authorized by the senior environmental assessment officer.

Buffers are work areas where restricted activities such as low ground disturbance clearing are permitted.

Where applicable, site specific setback and buffers are prescribed in specific mitigation measures for each ESS.

2.2.1 Flagging and signage standards

Clear identification of ESS locations and applicable buffers in the field is an important part of successful environmental protection implementation. Establishing consistent use of signage and flagging tape across the project is important to reduce confusion and for the clear identification of environmentally sensitive sites (ESS) and travel routes.

2.2.1.1 Flagging

A system of standardized flagging colors have been established to reduce the potential for confusion during construction where there are multiple or overlapping areas being identified. Due to a large number of ESS, the flagging has grouped and categorized each category. The color pattern used to identify categories is found below and is also identified with the ESS in the associated CEnvPP Mapbook.

Yellow/Black-

Heritage (Archaeological, Cultural or Historic importance)

Orange/Black-

Access routes (Intersections with trails etc),

Land Use (Conservation, Crown Land Encumbrance, Recreation, Residential)

Resource Use (Agriculture, Food/Medicinal, Forestry, Hunting/Fishing, Trapping)

Pink/Black-

Ecosystem (Habitat, Research or Species of concern, Invasive Species, Traditional Use)

Soils and Terrain (Erosion, Terrain)

Wildlife (Birds and Habitat, Mammals and Habitat, Reptiles/Amphibians and Habitat)

Blue/White-

Water (Water Crossings, Wetlands, Ground Water)

A Cross hatched flagging has been chosen as it is distinct from other flagging present during construction. Figure 4 shows the currently approved patterns and colors.

Figure 4: Examples of approved flagging tape used in delineating ESS

Flagging Instructions

Consistency in flagging procedure is important to its effectiveness. The goal of flagging is to clearly indicate the boundary of an Environmentally Sensitive Site (ESS) that requires a modification to construction activities in relation to the surrounding area. When identifying an area, flagging tape (color determined by categories above) will be tied to wooden staking and/or sturdy trees or shrubs that won't be cleared during construction activities. Flagging spacing will be decided on a site by site basis and will take into account, density of flagging already present in the area, the size of the area being flagged (smaller area requires higher number of flags) and the density of vegetation or topography present. The primary concern would be to apply flagging at a frequency that would make the line of separation obvious to construction crews.

Flagging a buffer

Environmentally sensitive site mitigation often involves establishing a buffer of a certain size around a location so that activities are modified in that location:

Point- A Buffer is established by measuring out from the center of that point to form a perimeter buffer. (measured as a radius).

Line-When buffering a line feature, the buffer is measured from the edge of the feature that the line indicates (on both sides).

Polygon- The buffer of an area is established by measuring out from the features edge creating a perimeter buffer, similar to a point buffer.

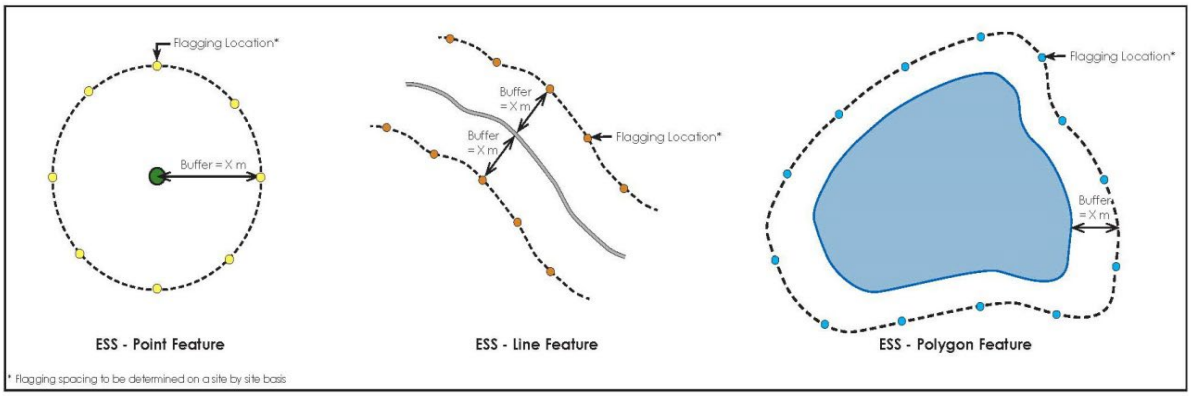

Figure 5: Buffer establishment for geometry types

2.2.1.2 Signage

Signage can be used in conjunction with flagging. Identification of vegetation clearing types, access or bypass trails as well as identification of ESS can be accomplished through the use of signage. Access signs are orange with black lettering, Bypass signs are yellow with black lettering and ESS signs are reflective white with black lettering. Signs will be a minimum of 12 inches by 12 inches.

Figure 6: Examples of access and signage

2.3 Riparian management

Based on characteristics and qualities of waterbodies in, or near the project footprint, contractors will need to modify land clearing, machinery passage and other construction activities, these sites will be identified on the map sheets of the construction section mapbook “Part 2”.

2.3.1 Riparian buffers

Riparian buffers (as shown in Table 2) are applied to riparian habitats, which include, streams, rivers, lakes and wetlands within the project footprint in which all shrub and herbaceous vegetation will be retained and all trees that do not violate Manitoba

Hydro vegetation clearance requirements will be retained. For slopes greater that 50% site investigation and prescription by the Manitoba Hydro senior environmental assessment officer is required.

The riparian buffer is composed of two zones: a management zone (variable width based on Table 2) that allows equipment to conduct low ground disturbance clearing and a minimum 7m machine free zone which only allows reaching into zone with equipment but not entering the zone except at trail crossing Figure 7).

Table 2: Riparian buffer and machine free zone distances based on slope

Slope of Land Entering Waterway (%)	Width of Machine Free Zone (m)	Width of Riparian Buffer (m)
10	7	30
20	10	40
30	15	55
40	20	70
50	25	85

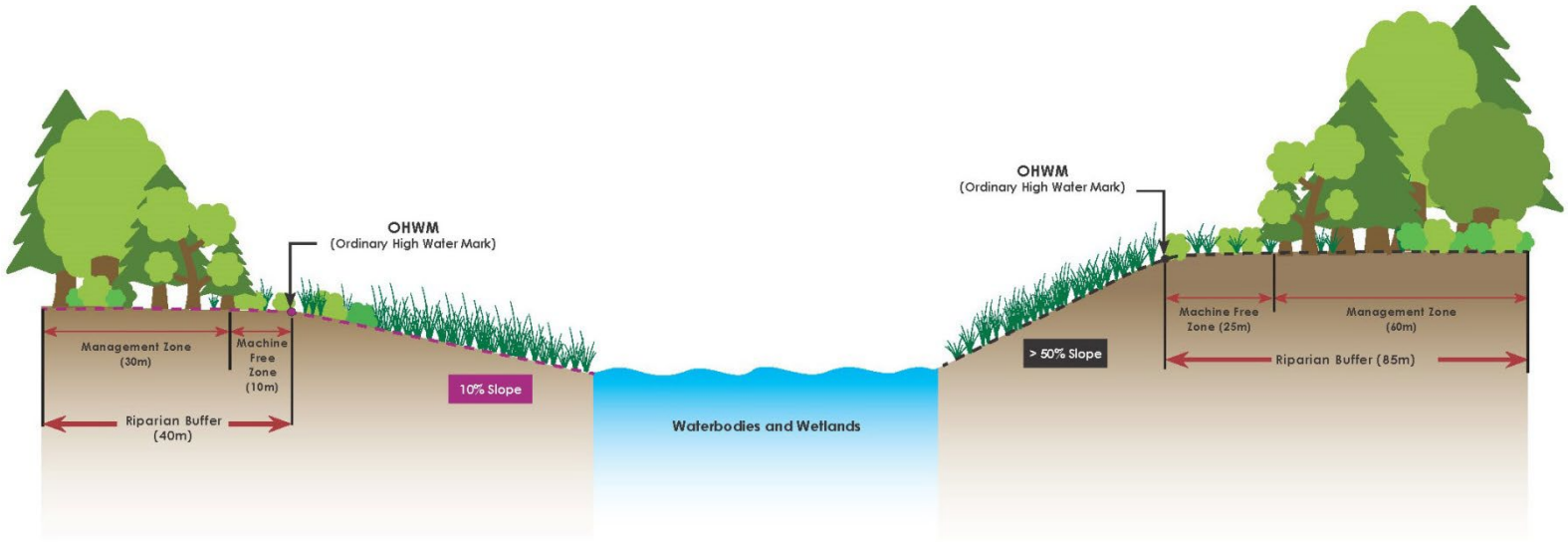

Figure 7: Example of zones in a riparian buffer

2.3.1.1 Machine free zones

Machine free zones are work areas where restricted activities such as low ground disturbance clearing (i.e hand cutting or feller buncher) are permitted by reaching into zone with equipment but not entering the zone. Where applicable, site specific buffers/setbacks are prescribed in specific mitigation measures for each feature.

Due to differences in topography and other site specific factors the Manitoba Hydro Environmental Officer retains the ability to adjust the width of the Machine Free Zone- to not less than 7m, when required.

Setbacks, riparian buffers and machine free zone distances from sensitive water features are provided in a "Buffers and setbacks" table found in Appendix D. Setbacks are to be maintained from a defined riparian habitat where no work shall occur.

Boundaries of riparian buffers and machine free zones are measured from the ordinary high water mark (OHWM). If the OHWM is unable to be determined, measure from the tree line (Figure 7). Setbacks (if required) are measured from the tree line or from a defined riparian boundary as delineated by an aquatic specialist.

2.3.2 Riparian mitigation

Activities associated with project construction pose a low risk to fish habitat. Because of this low level of risk, general mitigation measures will be applied to modify construction of overhead lines, temporary water crossings, ice bridges and snow fills (Section 5.2).

In addition to these general mitigation measures, contractors will implement setbacks and buffers as indicated on Site-specific information found in the map sheets of the construction section mapbook "Part 2".

2.3.3 Tower foundations within riparian buffers

In instances where tower placements require tower guy wires be located within a riparian buffer, a tracked excavator will be allowed to excavate the anchor foundation while minimizing ground disturbance as much as possible. The excavator must make one trail only and exit on that same trail. Each site where this occurs will be noted by MH environmental inspector/officers for monitoring by vegetation specialist the following season to determine if any further re-vegetation or rehabilitation is required.

2.4 Wildlife and habitat

2.4.1 Birds and habitat

Vegetation removal activities such as clearing and ground stripping can be destructive to birds and their habitat, such as tree and ground nests, as well as areas in which they find food (foraging areas). Birds and their habitat are particularly vulnerable during the breeding season when they mate, lay eggs and raise their young, as they are not able to relocate away from areas of disturbance. Migratory birds, such as geese, ducks and songbirds, and their habitat are protected by federal regulation, which prohibits killing, harassing or destroying the nests of these birds.

Potential effects of the project on birds include: mortality, habitat alteration and fragmentation, sensory disturbance, and disruption of movements. Increases in bird mortality can occur in a variety of forms including collisions with transmission wires and construction vehicles, electrocutions, increased predation and hunting. Bird-wire strikes are one of the most common causes of mortality for birds, particularly birds with short wings and large body masses. Collisions with wires are more likely over or near open water, the risk of collision would likely be greatest near rivers. As mitigation, bird diverters or aerial markers may be installed in high bird traffic areas. The location of theses bird diverter installations will be provided through design specifications and engineering drawings.

Should construction activities be required during breeding bird timing windows (see “Timing windows” table in Appendix C) please refer to the general mitigation approach for reducing risk to nesting birds found in the “Avian protection documents” (Appendix E; E-1). This decision tree will help to apply the appropriate approach and direct mitigation measures found in Appendices E-1 to E-5. These appendices prescribe levels of disturbance, the breeding bird timing windows, nest sweep and reporting procedures as well as buffer guidelines for each species identified. Through this process, Manitoba Hydro and its contractors will reduce the effects to birds and continue to meet regulatory compliance requirements.

2.4.2 Reptiles / amphibians

Areas where reptiles and amphibians, such as garter snakes, frogs, and toads, mate and lay eggs (i.e., breed) are sensitive to ground disturbance. Heavy equipment traffic and ground clearing activities that coincide with breeding activities can have a measurable

effect on local populations. Further, Manitoba is home to unique and endangered reptiles and amphibians, such as northern leopard frog (found throughout the province) that are protected by legislation and policy.

Potential Project effects on northern leopard frog and common snapping turtle during construction include habitat loss and alteration, which are threats to these populations. As these species are mainly found in riparian areas near large rivers, bodies of water or productive marshes, minimal habitat effects are anticipated with mitigation such as riparian buffers.

Mortality could increase in the project study area during construction due to increased road traffic. Northern leopard frogs are particularly susceptible to road mortality during migration and dispersal. Habitat identification

Amphibians should be assumed to be present in all wetland or shallow water areas supporting emergent vegetation (cattails, bulrushes, lily pads) during the amphibian emergence and breeding period (April 1st to August 15th). Where construction activities occur during this period, mitigations measures will be prescribed on a site by site basis, mitigations such as those found in the "Reptile and Amphibian protection document" found in Appendix F.

2.4.3 Mammals

Large-bodied mammals, such as white-tailed deer, are considered sensitive to disturbance. Sensory disturbance from construction activity could result in a temporary loss of effective habitat and disruption of movement, as individuals will likely avoid the construction zone. The risk of wildlife-vehicle collisions could increase due to a greater volume of traffic on roadways, increasing mortality of some mammal species, particularly larger ones such as white-tailed deer.

2.5 Species of concern

Species of concern can include rare vascular plants, rare non-vascular plants, rare wildlife species, and rare ecological communities. Additional mitigation measures may be developed by the environmental officer / inspector in consultation with a qualified biologist and, when necessary, the appropriate regulatory authority.

2.5.1 Species of concern discovery during pre-project construction

Species of conservation concern that are discovered during pre-project studies along the route have been assessed by an environmental specialist and appropriate mitigation measures have been outlined in the Part 2 CEnvPP mapbook. In the event that rare plants or wildlife species are discovered during future studies along the transmission line refer to the "Species of Concern contingency measures" document found in Appendix G. Further information regarding the discovery of bird nests can be found in Appendix E-3.

2.5.2 Species of concern discovery during project construction

In the event that rare plants, wildlife species or rare ecological communities are identified or suspected along the construction right-of-way during construction (*e.g.*, during survey activities, prior to clearing and construction). Suspend work immediately in the vicinity of any newly discovered species of concern and follow the measures outlined in "Species of Concern contingency measures" document found in Appendix G. Further information regarding the discovery of bird nests can be found in Appendix E-3.

2.6 Agricultural biosecurity

Manitoba Hydro's Agricultural Biosecurity Policy was created to prevent the introduction and spread of disease, pests and invasive plant species in agricultural land and livestock operations. Manitoba Hydro employees and contractors will follow this corporate policy through the execution of the Biosecurity Management Plan found in Appendix H.

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

The Biosecurity Management Plan also includes procedures to provide guidance and direction to staff and contractors/consultants who may be required to enter agricultural land and the levels of cleaning necessary to reduce the likelihood of transport of invasive species, pests or disease.

2.7 Soils and terrain

As the basis of natural, medicinal, spiritual and commercial vegetation, soils and their quality are an important part of ecosystem health and human wellbeing. The types of soil considered to be sensitive are topsoil (the thin, nutrient rich surface soil layer), and soils susceptible to wind erosion. Soils are generally sensitive to loss by erosion or mixing with less suitable soils and quality degradation from compaction. For soil protection measures refer to the Erosion and Sediment Control Plan. During construction, soil compaction and rutting can result from the movement of vehicles and equipment, storage of materials, and assembly and erection of towers. Effects of soil compaction and rutting can be mitigated by managing equipment traffic routes and activities for clearing of the transmission right-of-way (ROW), and installation of transmission towers to minimize the impact.

The risk to soils is highest with saturated soil conditions, should this situation arise during construction refer to Saturated/Thawed Soils Operating Guidelines (In Appendix J). Existing access routes are planned to be utilized wherever possible to avoid disturbing new areas.

2.7.1 Encountering unexpected contamination

Manitoba Hydro considers any of its electrical stations as potentially containing contaminated soils and/or groundwater; subsequently, there is potential to encounter contamination during construction activities. Contamination at Manitoba Hydro stations may have resulted from historical spills or leaks of fuels, oils, lubricants, and coolants. Manitoba Hydro may conduct environmental site assessments at a station any prior to construction to determine if contamination exists within the construction footprint. If contamination exists, remedial action plans will be prepared.

There is also potential to encounter non-Manitoba Hydro owned sites that may contain contaminated soils and/or groundwater; however, due to the majority of Project routing transecting agricultural lands, the potential is low.

The “Guidance for contaminated soils or groundwater identification and disposal” found in Appendix K provides details on proper mitigation.

2.8 Cultural and heritage resources

Archaeological sites, or sites where historic and pre-historic artefacts of human activity are found, are sensitive to disturbance and loss from ground disturbance activities, such as clearing and excavation. Artefacts may include tools and objects, such as arrowheads, pottery shards or bottles, or burial sites and human remains. These sites and objects are protected under legislation as a part of our common heritage. Manitoba Hydro is committed to protecting and preserving the environment including, cultural landscapes, and heritage resources affected by the Project. Sites identified as having spiritual or cultural importance through an ongoing First Nations and Metis engagement process (FNMEP) or other communications are considered sensitive to disturbance and should be respected for the values they have to communities.

The Cultural and Heritage Resources Protection Plan (CHRPP; Appendix L) is part of the environmental protection program.

The CHRPP sets out Manitoba Hydro's commitment to safeguard cultural and heritage resources and appropriately handle human remains or cultural and heritage resources discovered or disturbed during the construction of the project.

2.9 Access

Existing intersections, such as those for trails, provincial trunk highways (PTHs), provincial roads (PRs) and railways, are considered sensitive to change or conflicting land uses and as a fixed component of the larger transportation network, intersections are difficult to close or relocate. In conjunction with mitigation measures a standalone document, the access management plan, has been developed to safeguard and support the preservation of environmental, socio-economic, cultural and heritage values within the Projects' area of direct impact in the creation of new access.

3.0 Orientation and awareness

3.1 Pre-job meeting (environmental component)

A pre-job meeting will be held between the contractor (senior project staff including construction supervisors, environmental/safety officer) and Manitoba Hydro (senior staff including project engineer or designate, the senior environmental assessment officer, construction supervisor and the MH environmental officer / inspector). Upon completion of the meeting, all individuals present at the orientation, both Manitoba Hydro and the contractor representatives, will sign the "Environmental pre-work orientation record" found in Appendix N.

The environmental portion of this meeting will include review of:

- Manitoba Hydro's environmental principles and key environmental specifications of the contract
- Further relevant information or precautions that Manitoba Hydro is aware of which pertain to the job
- Procedures/requirements for dealing with environmental stop work orders or improvement orders
- Reporting requirements for environmental incidents and emergencies
- Documentation needs including the review of all pertinent forms (i.e. job planning form; environmental checklist)
- Requirement to educate/train all project employees with respect to the requirements of the CEnvPP

The contractor shall communicate to all field supervisors, subcontractors and work crews the work specifications, environmental requirements and information provided during the pre-job meeting and notify the senior environmental assessment officer in writing when it has been completed.

3.2 Contractor start-up meeting

A pre-work orientation meeting is held by the contractor with field crews prior to the initiation of work to ensure that they are aware of the environmental requirements of

work at that location. Should project conditions dictate a change in work location, another start-up meeting may be convened.

The contractor is required to ensure minutes, attendance records, and all other pertinent information is recorded and distributed. Manitoba Hydro will attend and if asked could provide an overview of the environmental concerns / ESS.

In situations where a new employee joins the project, it is the responsibility of the contractor's environment officer to ensure that that employee has been provided with the necessary information and/or training related to the environmental aspects of the project. The contractor will be required to document all instances of new employees to demonstrate that they have received the necessary training.

3.3 Weekly progress meetings

Senior field staff will meet on a weekly basis to review and discuss progress to date and planned upcoming work. These meetings will also review environmental requirements of the job and environmental precautions necessary. Manitoba Hydro will be responsible for the maintenance of minutes/documents related to these meetings.

3.4 Daily job planning meetings

Field crew job planning meetings will be held daily prior to the commencement of any work. The daily job-planning meeting will include a review of environmental requirements of the planned work and the applicable environmental precautions. All job planning meetings, including the environmental content, shall be documented by the contractor.

4.0 Contractor-developed environmental management plan

Construction contractors will be required to develop environmental management plans as part of the Environmental Protection Program for this project component.

The contractor shall be responsible to develop and implement specific plans for its work as described in Figure 1. Copies of these plans can be appended to the "Contractor developed plans" location in Appendix K when approved by the senior environmental assessment officer.

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5.0 Environmental mitigation requirements

Contractors must follow all mitigation measures identified to protect the environment, including environmental sensitive sites (ESS). Two types of mitigation measures must be followed:

- General mitigation measures apply to all project areas
- Specific mitigation measures apply to individual ESS

Contractors will need to modify construction activities in accordance with general mitigation measures (Section 5.2) and specific mitigation measures (see detailed maps and specific mitigation in the construction section Mapbook "Part 2").

5.1 General mitigation requirements

Construction considerations required for all Project areas are considered general mitigation and are applicable to all construction areas.

NOTE: Site specific mitigation measures found in mapbooks will override the general mitigation measures found below.

There is overlap and duplication of mitigation measures amongst the above categories, this allows the user to look up the actions they must perform by different categories. The general mitigation measures are provided under the following five categories: 1) Management (MM); 2) Project activity (PA); 3) Project component (PC); 4) Environment component (EC); and 5) Environmental issue (EI), as follows:

(MM) Management environmental protection measures include management, contractual, administrative and other measures that are common to all environmental protection categories and topics.

(PA) Project activity environmental protection measures include construction activities that are likely to cause direct environmental effects. Project activities are action words or phrases that are carried out during construction of the Project such as drilling, clearing, etc.

(PC) Project component environmental protection measures relate to major components of the Project. The Project is very large and complex consisting of several major components including transmission lines, converter stations and ground electrode facilities, and involves access trails, stream crossings, construction camps, marshalling yards, etc.

(EC) Environmental component protection measures include important or vulnerable components of the environment that are subject to environmental effects of the Project. Some environmental components are particularly vulnerable to construction of transmission lines, converter stations, ground electrode facilities and other project components and activities, and warrant separate consideration. Example environmental components include agricultural areas, fish habitat, heritage sites and wetlands.

(EI) Environmental issue and topic protection measures include important issues and topics identified for the Project. Environmental issues and topics include emergency response, erosion/sediment control, hazardous substances, petroleum products and soil contamination.

5.2 General mitigation tables

Access roads and trails (PC-1)	
ID	**Mitigation**
PC-1.01	Access roads and trails no longer required will be decommissioned and rehabilitated in accordance with the Rehabilitation and Invasive Species Management Plan.
PC-1.02	Access roads and trails required for future monitoring, inspection or maintenance will be maintained in accordance with the Access Management Plan.
PC-1.03	Access roads and trails will be constructed to a minimum length and width to accommodate the safe movement of construction equipment.
PC-1.04	Access roads and trails will be constructed and operated in accordance with contract specifications.
PC-1.05	Access roads and trails will be provided with erosion and sediment control measures in accordance with the Erosion and Sediment Control Plan.
PC-1.06	All season access roads will not be permitted within established buffer zones and setback distances from waterbodies, wetlands, riparian areas and water bird habitats.
PC-1.07	Approach grades to waterbodies will be minimized to limit disturbance to riparian areas.
PC-1.08	Bypass trails, sensitive sites and buffer areas will be clearly marked prior to clearing, to identify that prescribed selective clearing is to occur as per map sheets.
PC-1.09	Contractor will be restricted to established roads and trails, and cleared construction areas in accordance with the Access Management Plan.
PC-1.10	During winter construction, where necessary (i.e. unfrozen wetlands, creeks), equipment will be wide-tracked or equipped with low-ground pressure tires to minimize rutting and limit damage and compaction to surface soils. If wet conditions exist the use of construction matting/temporary bridge is also permitted.
PC-1.11	Equipment, machinery and vehicles will only travel on cleared access roads and trails, and will cross waterways at established temporary and permanent crossings.

Access roads and trails (PC-1)	
ID	**Mitigation**
PC-1.12	Existing access roads, trails or cut lines will be used to the extent possible. Permission to use existing resource roads (i.e. forestry roads) will be obtained.
PC-1.13	MSD work permits will be obtained prior to the commencement of the project.
PC-1.14	No chemical melting agents are to be utilized.
PC-1.15	Only water and approved dust suppression products will be used to control dust on access roads where required. Oil or petroleum products will not be used.
PC-1.18	Routing for access roads and trails should follow natural terrain contours to the extent possible and should be minimized adjacent to and approaching waterbodies.
PC-1.19	Surface water runoff will be directed away from disturbed and erosion prone areas but not directly into waterbodies.
PC-1.20	Vegetation control along access roads and trails will be in accordance with Rehabilitation and Invasive Species Management Plan.
PC-1.23	The contractor shall check that rock utilized for access road construction does not have acid or alkali generating properties.
PC-1.24	All constructed access points onto Manitoba Infrastructure (MI) roadways (Provincial Roads or Provincial Trunk Highways) will require a permit from MI.
PC-1.25	Heavy equipment will not be allowed access to MI roadways without the appropriate protection and permits.
PC-1.26	Access roads and trails that use or cross MI roadways care will be taken to ensure excessive amounts of material are not tracked onto the roadway, with contractor being responsible for cleanup.
PC-1.27	Any temporary constructed access and associated debris within an MIT right of way will need to be removed seasonally and once the project is completed.
PC-1.28	All works undertaken within the MI right-of-way (ROW) will adhere to the MI traffic control policies.

Access roads and trails (PC-1)	
ID	**Mitigation**
PC-1.30	Required travel off existing roads will be minimized and restricted to previously designated and approved routes.
PC-1.31	The contractor is required to install and maintain access road signage indicating road or trail number as per signage standards.
PC-1.32	If a prospective access road or trail is located off easement and on private land, a private land agreement must be submitted to MH for approval prior to any access use occurring

Agricultural areas (EC-1) [If applicable]	
ID	Mitigation
EC-1.01	All fences and gates will be left in "as-found" condition.
EC-1.02	Any necessary access on agricultural lands will be discussed in advance with the landowner.
EC-1.03	Construction areas and sites will be assessed for compaction and if required will be rehabilitated as per the Rehabilitation and Invasive Species Management Plan, prior to returning them to agricultural use.
EC-1.04	Erosion and sediment control measures will be established in accordance with the Erosion and Sediment Control Plan before construction work commences in agricultural areas where necessary.
EC-1.05	Excess construction materials (i.e. waste, granular fill, clay) will be removed from construction sites and areas located on agricultural lands. Area will be restored to pre-existing conditions.
EC-1.06	Existing access to agricultural lands will be utilized to the extent possible.

Agricultural areas (EC-1) [If applicable]	
EC-1.07	Required travel off existing roads will be minimized and restricted to previously designated and approved routes.
EC-1.08	Vehicle and equipment travel on agricultural lands will follow existing roads, trails and paths to the extent possible.
EC-1.09	Where access to agricultural land is necessary the biosecurity management plan must be followed.
EC-1.10	When construction activities take place through agricultural lands drainage patterns are not to be altered, any anticipated diversions of surface water will require authorization under The *Water Rights Act*. This applies to creating new drainage, blocking natural drainage or diverting flows around a site.

Aircraft use (EI-1) [If applicable]	
ID	**Mitigation**
EI-1.01	Contractors using aircraft will submit flight plans in advance of flying to the Manitoba Hydro project engineer or delegate during active construction periods.
EI-1.02	Fuel storage, handling and dispensing at aircraft landing areas will conform to provincial legislation and guidelines.

Blasting and exploding (PA-1)	
ID	Mitigation
PA-1.01	A communication protocol will be developed to notify affected parties of blasting operations and conductor splicing. Affected parties may include Manitoba Sustainable Development, RCMP, municipalities, landowners, and resource users.

Blasting and exploding (PA-1)	
ID	Mitigation
PA-1.02	Blasting will be conducted and monitored in accordance with Fisheries and Oceans Canada Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters.
PA-1.04	Blasting will not be permitted during timing windows established for sensitive bird breeding, nesting and brood rearing months.
PA-1.05	Explosives will be stored, transported and handled in accordance with federal requirements through the *Explosives Act* and *Transportation of Dangerous Goods Act* and provincial regulations stated in *The Workplace Safety and Health Act*.
PA-1.06	Implode compression conductor splicing will be minimized to extent possible on weekends and after normal working hours in residential areas.
PA-1.07	Quarry blasting operations and conductor splicing will be scheduled to minimize disturbance to wildlife and area residents, and to ensure the safety of workers.
PA-1.08	The blasting contractor will be in possession of valid licenses, permits and certificates required for blasting in Manitoba.
PA-1.09	The blasting contractor will submit a blasting plan to the construction supervisor for review and approval prior to commencement of blasting operations.
PA-1.10	Use of ammonium nitrate and fuel oil will not be permitted in or near waterways. Only DFO approved explosives shall be permitted in or near waterways.
PA-1.11	Warning signals will be used to warn all project personnel and the public of safety hazards associated with blasting.

Blasting and exploding (PA-1)	
ID	Mitigation
PA-1.12	Written and/or oral notification will be outlined in the communication plan prior to each blasting period.
PA-1.15	The blasting contractor shall check that blast rock does not have acid or alkali generating properties.

Borrow pits and quarries (PC-2)	
ID	Mitigation
PC-2.01	Decommissioning of access to abandoned borrow pits and quarries will be managed in accordance with the Access Management Plan.
PC-2.02	All equipment and structures will be removed from borrow pits prior to abandonment.
PC-2.03	Borrow pits and quarries will be designed, constructed and operated in compliance with provincial legislation and guidelines.
PC-2.04	Borrow pits and quarries will not be located within 150 m of a provincial trunk highway or provincial road unless an effective vegetated berm is provided to shield the area from view.
PC-2.05	Borrow pits and quarries will not be located within established buffer zones and setback distances from identified environmentally sensitive sites without approval from MH environmental officer.
PC-2.06	Drainage water from borrow pits and quarries will be diverted through vegetated areas, existing drainage ditch(es) or employ a means of sediment control prior to entering a waterbody.
PC-2.07	Erosion and sediment controls will be put in place in accordance with the Erosion and Sediment Control Plan before borrow pit excavation

Borrow pits and quarries (PC-2)	
ID	Mitigation
	commences, when required as determined by the MH environmental officer / inspector.
PC-2.08	Fuel storage will not be permitted near stockpiles outlined in PC 5.21.
PC-2.09	Garbage, debris or refuse will not be discarded into borrow pits and quarries.
PC-2.10	Only water and approved dust suppression products will be used to control dust on access roads where required. Oil or petroleum products will not be used.
PC-2.11	Organic material, topsoil and subsoil with-in borrow pits and quarries will be stripped and stockpiled for use in future site rehabilitation.
PC-2.12	Previously developed borrow sites and quarries will be used to the extent possible before any new sites are developed.
PC-2.15	Vegetated buffer areas will be left in place when borrow pits are cleared in accordance with provincial guidelines.
PC-2.16	Vegetation control at borrow pits and quarries will be in accordance with the Rehabilitation and Invasive Species Management Plan.
PC-2.17	Vegetation in active Manitoba Hydro permitted borrow pits and quarries will be maintained as per the Rehabilitation and Invasive Species Management Plan.
PC-2.18	Worked out borrow pits and granular quarries will be left with a slope no steeper than 4:1 (horizontal to vertical) side slopes.
PC-2.24	The blasting contractor shall check that blast rock does not have acid or alkali generating properties.

Borrow pits and quarries (PC-2)	
ID	Mitigation
PC-2.26	Vehicles hauling materials to or from the work site that have the potential for dust emissions should be hauled with the load enclosed by an anchored tarp, plastic or other material.
PC-2.27	As marshalling yards, borrow sources, temporary work spaces, work camps are identified or route changes required, additional heritage monitoring activities may be required to be conducted prior to approval.

Built-up and populated areas (EC-2) [If applicable]	
ID	Mitigation
EC-2.01	Construction activities and equipment will be managed to avoid damage and disturbance to adjacent properties, structures and operations.
EC-2.02	Mud, dust and vehicle emissions will be managed in a manner that ensures safe and continuous public activities near construction sites where applicable.
EC-2.03	Noisy construction activities where noise and vibration may cause disturbance and stress in built-up areas will be limited by applicable noise bylaws.
EC-2.04	All stockpiles shall be maintained as to minimize dust associated with fine soils prone to wind erosion (i.e. covering with tarp/poly, maintain wetted surface).
EC-2.05	Vehicles hauling materials to or from the work site that have the potential for dust emissions should be hauled with the load enclosed by an anchored tarp, plastic or other material.

Built-up and populated areas (EC-2) [If applicable]	
EC-2.06	Construction activities will be conducted as per applicable noise bylaws.

Clearing (PA-3)	
ID	Mitigation
PA-3.01	Riparian buffers shall be a minimum of 30 m and increase in size based on slope of land entering waterway (see riparian buffer table in CEnvPP). Within these buffers shrub and herbaceous understory vegetation will be maintained along with trees that do not violate Manitoba Hydro vegetation clearance requirements.
PA-3.02	Access to clearing areas will utilize existing roads and trails to the extent possible.
PA-3.03	All clearing and construction equipment is to remain within the bounds of access routes and the Project footprint identified.
PA-3.04	Areas identified for selective clearing (e.g., buffer zones, sensitive sites) will be flagged prior to clearing.
PA-3.05	Chipped or mulched material may be collected for use in construction areas and sediment / erosion control on site.
PA-3.07	Cleared trees and woody debris will not be pushed into (or adjacent) to standing timber, or within the high-water mark of wetlands or waterbodies
PA-3.10	Clearing is allowed only within the reduced risk time period for wildlife illustrated (in Appendix C). If clearing within the sensitive time period for wildlife, further mitigation and approvals would be required.
PA-3.11	Clearing within environmentally sensitive sites, not designated for organic removal will be carried out in a manner that minimizes disturbance to existing organic soil layer.
PA-3.12	Construction vehicles where possible will be wide-tracked or equipped with low-ground pressure tires to minimize rutting and limit damage and compaction to surface soils.

Clearing (PA-3)	
ID	Mitigation
PA-3.13	Construction vehicles, machinery and heavy equipment will not be permitted in designated machine-free zones except at designated crossings.
PA-3.14	Danger trees will be flagged/marked for removal using methods that do not damage soils and adjacent vegetation.
PA-3.15	During clearing environmentally sensitive sites, along the right of way will be clearly identified by signage and/or flagging
PA-3.16	In locations where grubbing and vegetation stripping is not required, disturbance to roots and adjacent soils will be minimized.
PA-3.17	Machine clearing will remove trees and brush with minimal disturbance to existing organic soil layer using a shear "V" or "K-G" type blades, feller-bunchers, mulcher, chipper and other means approved by the MH environmental officer.
PA-3.18	Property limits, right-of-way boundaries, buffers and sensitive areas (where applicable) will be clearly marked with stakes and/or flagging tape prior to clearing.
PA-3.20	Slash piles will be placed at least 15 m from forest stands.
PA-3.21	Slash piles will not be placed on the surface of frozen waterbodies and will not be located within established setbacks from waterbodies or within the ordinary high water mark.
PA-3.22	If extreme wet weather or insufficient frost conditions results in soil damage from rutting refer to the sediment and erosion control plan as well as the saturated/thawed soils operating guidelines
PA-3.23	Trees containing active nests and areas where active animal dens or burrows are encountered will be left undisturbed until unoccupied.

Clearing (PA-3)	
ID	Mitigation
PA-3.24	Trees will be felled toward the middle of rights-of-way or cleared area to avoid damage to standing trees. Trees will not be felled into waterbodies.
PA-3.26	As per Clearing Management Plan, timber that is not salvaged will be chipped and/or mulched in accordance with timing windows, or permit conditions.
PA-3.28	If clearing is needed on a Manitoba Infrastructure (MI) roadway ROW, clearance must be obtained from MI in advance.
PA-3.29	When elm trees are removed the stump must be debarked to the soil line or stump must be ground or removed to flush or just below the soil line.
PA-3.30	All elm wood must be immediately disposed of onsite by burning/chipping (<5cm) or transported to a designated elm disposal site.
PA-3.31	Storing elm wood firewood is prohibited under the *Dutch Elm Disease Act*.
PA-3.32	During mulching or chipping activities, debris must be directed away and not enter watercourses.

Concrete wash water and waste (EI-13)	
ID	Mitigation
EI-13.01	Wash water and solid waste will not be discharged onto the ground at the project site.
EI-13.02	All concrete solid waste and wash water will be collected and removed from the project site by the concrete supplier or treated on site in an approved settling pond.

Concrete wash water and waste (EI-13)	
ID	Mitigation
EI-13.03	High density polyethylene geomembrane liners and either earth or physical berms may be used for a temporary concrete washout for uncured or partially cured concrete.
EI-13.04	All water from chute washing activities will be contained in leak proof containers or in an approved settling pond.
EI-13.05	All water that has been used for wash out purposes and associated activities will be disposed in an appropriately sized settling pond(s) treated to meet turbidity (total suspended solids [TSS]) and pH requirements prior to discharge. Turbidity will be treated by settlement or filtration; pH will be treated by use of acid, dry ice, carbon dioxide gas or other methods.
EI-13.06	All water that has been used for wash out purposes and associated activities will be treated to meet the Manitoba Water Quality Standards, Objectives, and Guidelines (Tier 1) for municipal wastewater effluents of 25 mg/L TSS prior to discharge.
EI-13.07	All water that has been used for wash out purposes and associated activities will be treated to meet the Manitoba Water Quality Standards, Objectives, and Guidelines (Tier 3; MWS 2011) for the protection of aquatic life for pH 6.5-9.0, prior to discharge into a watercourse.
EI-13.08	Cured concrete can be transported in non-hazardous waste containers and disposed of at a licensed facility.
EI-13.09	Any uncured and partly cured concrete will be kept isolated from watercourses/ditches.

Construction camps (PC-3) [If applicable]	
ID	Mitigation
PC-3.01	A food handling permit will be obtained from the local public health inspector prior to the operation of kitchens.
PC-3.02	Animal-proof garbage containers with regular removal of food waste to approved waste management facilities will be used to manage food waste.
PC-3.03	Construction camp sites will be kept tidy at all times. Waste materials including litter will be collected for disposal..
PC-3.04	Construction camps will be located based on criteria that consider soil type, topography, land form type, wildlife habitat and other environmental factors.
PC-3.05	Crown land permits will be obtained for construction camps as required.
PC-3.06	Erosion sediment control in accordance with the Erosion and Sediment Control Plan and drainage management measures will be put in place prior to construction where applicable.
PC-3.07	Feeding or harassment of any wildlife is prohibited.
PC-3.08	Firebreaks will be constructed around camp locations where there is a risk of fire.
PC-3.09	Hunting and harvesting of wildlife by project staff will not be permitted while working on the project sites.
PC-3.10	Liquid and solid sewage wastes held in tanks will be removed in accordance with the Waste and Recycling Management plan by a licensed contractor and taken to licensed or approved disposal areas.
PC-3.11	Problem wildlife will be reported immediately to the nearest Manitoba Sustainable Development office.

Construction camps (PC-3) [If applicable]	
ID	Mitigation
PC-3.12	Propane tanks for camp use will be stored in dedicated, vehicle protected and secure areas at a safe distance from kitchen and sleeping quarters in accordance with provincial legislation and national codes.
PC-3.13	Sewage and grey water holding tanks will be sited in accordance with provincial legislation, and federal and provincial guidelines, and a minimum of 100 m from the ordinary high water mark of any waterbody.
PC-3.14	Sewage and grey water will be collected in holding tanks and chemical toilets.
PC-3.15	Spill control and clean-up equipment and materials will be provided for construction camps in accordance with the Emergency Preparedness and Response Plan.
PC-3.16	The MH Environmental Officer /Inspector will inspect rehabilitated construction camps in accordance with the Rehabilitation and Invasive Species Management Plan to assess the success of re-vegetation and to determine if additional rehabilitation is required.
PC-3.17	Vegetation control at construction camps will be in accordance with the Rehabilitation and Invasive Species Management Plan.
PC-3.18	Waste and recyclables will be sorted, segregated and removed in accordance with the Waste and Recycling Management Plan to a licensed or approved waste management facilities site and/or recycling facility.
PC-3.19	Food, greases and wastes will be stored in sealed, air-tight containers and managed as per PA-3.2.
PC-3.20	If a prospective camp is to be located on private land, a private land agreement must be submitted to MH for approval prior to any setup occurring

Construction camps (PC-3) [If applicable]	
ID	Mitigation
PC-3.21	As marshalling yards, borrow sources, temporary work spaces, work camps are identified or route changes required, additional heritage monitoring activities may be required to be conducted prior to approval.
PC-3.22	Burning of solid wastes including kitchen wastes will not be permitted.

Construction matting (PA-11)	
ID	Mitigation
PA-11.01	Verify that mats are clean and free of soil, debris and plant material when they arrive for use on site.
PA-11.02	Mats cannot be constructed of chemically treated wood products.
PA-11.03	In wetlands three mats is the maximum number that can be stacked and used in one location.
PA-11.04	Follow the biosecurity management plan for cleaning washing and disinfecting matting prior to moving it to a new project location.
PA-11.06	Matting should not impede or redirect natural drainage patterns or water courses.
PA-11.07	Mat removal will take place from the existing mat road, working in a backwards fashion (from work site to initial access point).
PA-11.08	When mat removal is complete all remaining matting debris will be cleaned, up and transported to an approved waste disposal facility
PA-11.09	When matting is removed any compaction of soils will have to be rehabilitated

Demobilizing and cleaning up (PA-4)	
ID	Mitigation
PA-4.01	Temporary buildings, structures, trailers, equipment, utilities, waste materials, etc. will be removed from construction areas and sites when work is completed.
PA-4.02	Construction access roads/trails will be decommissioned and rehabilitated as per the Access Management Plan.
PA-4.03	After demobilizing and clean-up, construction areas and sites will be assessed by the contractor for rehabilitation. Contractor prescriptions will be developed as per Rehabilitation and Invasive Species Management Plan and submitted for approval to MH environmental officer.
PA-4.05	Petroleum product and other temporary hazardous material storage areas will be cleaned up, assessed and, if necessary, remediated in accordance with provincial guidelines and Manitoba Hydro guidelines.
PA-4.06	Water crossings, ditches and drains will be left free of obstructions so as not to impede water flow.

Directional drilling (PA-12)	
ID	Mitigation
PA-12.01	A frac-out contingency plan will be prepared that includes measures to stop work, contain the drilling mud and prevent its further migration into the watercourse.
PA-12.02	When drilling takes place under a watercourse, the drill entry and exit points will be outside of the riparian buffer of that watercourse.
PA-12.03	A dugout/settling basin at the drilling exit site will be constructed to contain drilling mud to prevent sediment and other deleterious substances from entering the watercourse. If this cannot be achieved, silt fences or other effective sediment and erosion control measures will be installed to prevent drilling mud from entering the watercourse.
PA-12.04	Excess drilling mud, cuttings will be disposed of at an adequately sized disposal site located away from the water to prevent it from entering the watercourse.
PA-12.05	Keep all material and equipment needed to contain and clean up drilling mud releases on site and readily accessible in the event of a frac-out.
PA-12.06	In the event of a frac-out, implement the frac-out contingency plan and notify all applicable authorities. Prioritize clean-up activities relative to the risk of potential harm and dispose of the drilling mud in a manner that prevents re-entry into the watercourse.
PA-12.07	Stabilize any spoil materials to prevent them from entering the watercourse.
PA-12.08	Re-vegetate any disturbed native vegetation by seeding with native grass species and cover such areas with mulch to prevent erosion and to assist in seeds germination. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with

Directional drilling (PA-12)	
ID	Mitigation
	erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
PA-12.09	Maintain effective sediment and erosion control measures in accordance with the Erosion and Sediment Control Plan until re-vegetation of disturbed areas is achieved.
PA-12.10	When obtaining water from fish bearing waterways all pump intakes will be screened according to the *Freshwater Intake End-of-Pipe Fish Screen Guideline* (DFO 1995).
PA-12.11	Water, to mix the drilling mud, shall be brought in from off site and stored in tanks at the entry locations or be withdrawn from local a watercourse.

Draining (PA-5)	
ID	Mitigation
PA-5.01	Construction activities shall not block natural drainage patterns.
PA-5.02	Culverts will be installed and maintained in accordance with *Manitoba Stream Crossing Guidelines* (DFO and MNR 1996) and relevant provincial and municipal acts, regulations and bylaws.
PA-5.03	Dewatering discharges from construction activities will be directed into vegetated areas, existing drainage ditch(s) or a means of sediment control at such a rate that will have adequate flow dissipation at the outlet to ensure it does not cause erosion at the discharge point or at any point downstream.
PA-5.04	Drainage water from construction areas will be diverted through vegetated areas, existing drainage ditch(s) or a means of sediment control prior to entering a waterbody.
PA-5.05	Erosion and sediment control will be provided by the contractor in accordance with the Erosion and Sediment Control Plan.
PA-5.06	Existing, natural drainage patterns and flows will be identified and maintained to the extent possible.
PA-5.14	Flows to Manitoba Infrastructure (MI) roadway drains and ditches will not be altered by construction (increased flow, de-watering and other flow effects) without department approval in advance.
PA-5.15	All drainage, natural or manmade that may deposit construction generated sediments on the MI roadway right-of-way will be managed through the Erosion and Sediment Control Plan.

Drilling (PA-6)	
ID	Mitigation
PA-6.01	Abandoned drill holes will be sealed with bentonite or other effective sealers to prevent interconnection and cross-contamination of ground and surface waters.
PA-6.03	Drilling equipment and machinery will not be serviced within 100 m of waterbodies or riparian areas.
PA-6.04	Drilling fluids and waste materials will be contained and not allowed to drain into waterbodies, riparian areas or wetlands.
PA-6.05	Drilling in environmentally sensitive sites, features and areas will not be permitted unless approved in advance by MH Environmental Officer /Inspector and mitigation measures are implemented.
PA-6.07	Drilling will not be permitted within established buffer zones and setback distances from waterbodies unless approved in advance by MH environmental officer.
PA-6.08	Spill control and clean-up equipment will be provided at all drilling locations.
PA-6.09	The drilling contractor will ensure that equipment and materials are available on site for sealing drill holes.
PA-6.10	The drilling contractor will inspect drilling equipment and machinery for fuel and oil leaks prior to arrival at the project site, and will inspect for fuel and oil leaks and spills regularly.
PA-6.11	Where there is potential for mixing of surface and groundwater, precautions will be taken to prevent the interconnection of these waters.
PA-6.12	The contractor must submit a plan to the MH environmental officer describing how surface water, drill flush, and excess waste grout will be controlled and disposed of, including emergency response plans for working

Drilling (PA-6)	
	in groundwater environmentally sensitive sites for sealing/grouting artesian wells and pumping (if required) excess groundwater.

Emergency response (EI-2)	
ID	Mitigation
EI-2.01	All fires will be reported to Manitoba Hydro
EI-2.02	All spills at construction sites will be reported to Manitoba Hydro
EI-2.03	All vehicles hauling petroleum products will carry spill containment and clean-up equipment.
EI-2.04	Clean-up and the disposal of contaminated materials will be managed in accordance with provincial guidelines and Manitoba Hydro guidelines.
EI-2.05	Emergency Preparedness and Response Plans and procedures will be communicated to all project staff and a copy will be made available at the project site.
EI-2.06	Emergency spill response and clean-up materials and equipment will be available at construction sites, marshaling yards, fuel storage facilities and standby locations.
EI-2.07	Fire extinguishers will be mounted on buildings at locations where they will be most readily accessible. Safety officers will conduct annual inspections of fire extinguishers.
EI-2.08	Orientation for contractor and Manitoba Hydro employees working in construction areas will include emergency response awareness.
EI-2.09	Contractor to conduct investigation for all provincially reportable spills and fires reported to ensure that procedures are followed and plans remain effective.

Emergency response (EI-2)	
ID	Mitigation
EI-2.10	Project emergency response and evacuation procedures in the Emergency Preparedness and Response Plan will be adhered to in the event of forest fires.
EI-2.11	Reasonable precautions will be taken to prevent fuel, lubricant, fluids or other products from being spilled during equipment operation, fuelling and servicing.
EI-2.12	Spill response and clean up equipment will be available for responding to releases for a site location.
EI-2.13	Temporary construction camps will have a designated fire marshal in accordance with the Emergency Preparedness and Response Plan.
EI-2.14	The Emergency Preparedness and Response Plan will be prepared by the contractor, approved by the MH environmental officer prior to construction and updated annually.
EI-2.15	The hazardous materials incident report form will be completed when reporting a spill.
EI-2.16	Should a forest fire be caused by project activities, it must be reported to Manitoba Hydro immediately.
EI-2.17	Firefighting equipment required by legislation, guidelines, contract specifications and work permits will be kept on site and maintained in serviceable condition.

Erosion and sediment control (EI-3)	
ID	Mitigation
EI-3.01	Accumulated sediment will be removed from silt fences and other barriers in accordance with the Erosion and Sediment Control Plan to ensure proper functioning.
EI-3.02	Construction activities may be suspended during extreme wet weather events as per the Saturated/Thawed Soils Operating Guidelines.
EI-3.04	Erosion and sediment control installations will only be removed after disturbed areas are protected and sediments are disposed of in accordance with Erosion and Sediment Control Plan.
EI-3.05	Erosion and sediment control measures will be left in place and maintained until either natural vegetation or permanent measures are established.
EI-3.06	Erosion and sediment control measures will be put in place in accordance with the Erosion and Sediment Control Plan prior to commencement of construction activities and will remain intact for the duration of the project.
EI-3.08	The contractor will be responsible for implementing the Erosion and Sediment Control Plan with procedures put in place prior to commencement of applicable construction activities.
EI-3.09	The contractor will be responsible for monitoring and if required modifying erosion and sediment control installations to ensure continued effectiveness.
EI-3.10	The contractor will communicate the requirement to follow the Erosion and Sediment Control Plan to all project staff and a copy will be made available at the project site.
EI-3.11	The MH Environmental Officer /Inspector will make inspections of erosion and sediment control measures to confirm implementation and continued effectiveness.

Fish protection (EC-3)	
ID	Mitigation
EC-3.01	When a work, undertaking or activity results in the deposit of a deleterious substance or creates the potential for such a deposit, Manitoba Hydro will advise DFO of the situation.
EC-3.02	Disturbances to waterbodies, shorelines, riparian areas, etc. will be stabilized to prevent erosion immediately.
EC-3.03	Erosion and sediment control measures will be put in place in accordance with the Erosion and Sediment Control Plan at all project locations where surface drainage is likely to flow into fish bearing waters.
EC-3.04	Fish and fish habitat will be protected in accordance with federal legislation and federal and provincial guidelines.
EC-3.05	Prior to seeking authorization from Manitoba Sustainable Development (MSD) for removal of a Muskrat house, Beaver Dam or Lodge documentation of reasonable attempts to trap resident beavers/muskrat must be provided. Attempts to trap resident Beavers/muskrats must be undertaken by a licensed trapper or person with a valid Wild Animal Kill Permit.
EC-3.06	Project personnel will be prohibited from fishing at project locations or along rights-of-way.
EC-3.07	When obtaining water from fish bearing waterways all pump intakes will be screened according to the *Freshwater Intake End-of-Pipe Fish Screen Guideline* (DFO 1995).
EC-3.08	The withdrawal of any water will not result in reduction in the wetted width of a stream, in order to maintain existing fish habitat

EC-3.09	In watercourses where mussel species of conservation concern are known to occur, watercourse crossings may occur by boat or barge, or during winter (i.e., under frozen conditions) to prevent mortality of the mussels.
Fish protection (EC-3) – continued	
ID	Mitigation
EC-3.10	Muskrat house, Beaver Dam or Lodge removal requires consultation with and the Department of Fisheries and Oceans who may require additional authorizations. House, Dam or Lodge removal may require heavy equipment or explosives which would require an additional Work Permit from Sustainable Development when located on Crown Land.

Grading (PA-7)	
ID	Mitigation
PA-7.02	Grading for gravel pads for construction areas and access roads will be limited to areas where it is needed for the safe and efficient operation of vehicles, machinery and construction equipment.
PA-7.03	Grading for site rehabilitation and restoration will be in accordance with the Rehabilitation and Invasive Species Management Plan.
PA-7.04	Grading will not be permitted within established buffer zones and setback distances from waterbodies.
PA-7.05	Grading will only be permitted within rights-of-ways and construction areas.
PA-7.06	Gravel pads will be graded so the surface runoff is directed away from waterbodies, riparian areas and wetlands.
PA-7.07	Required erosion and sediment control measures will be put in place prior to grading in accordance with the Erosion and Sediment Control Plan.

Groundwater (EC-4)	
ID	Mitigation
EC-4.01	Potable water samples will be collected every two weeks and submitted for analysis according to provincial sampling and analysis protocol.
EC-4.02	Well locations will be marked with flagging tape prior to construction.
EC-4.03	Where there is potential for mixing of surface and groundwater, precautions will be taken to prevent the interconnection of these waters.
EC-4.04	The contractor must submit a plan to the MH environmental officer describing how surface water, drill flush, and excess waste grout will be controlled and disposed of, including emergency response plans for working in groundwater environmentally sensitive sites for sealing/grouting artesian wells and pumping (if required) excess groundwater

Grubbing (PA-8)	
ID	Mitigation
PA-8.01	Construction areas containing soil with high silt content, artesian springs or areas of previous erosion will assessed by MH environmental officer / inspector for additional erosion and sediment control measures.
PA-8.02	Construction areas requiring extensive grubbing will be stabilized as soon as possible to minimize erosion.
PA-8.03	Grubbing will be halted during heavy precipitation events when working in areas of finely textured soils.
PA-8.04	Grubbing will not be permitted within 2 m of standing timber to prevent damage to root systems and to limit the occurrence of blow down.
PA-8.05	Grubbing will not be permitted within established buffer zones and setback distances from waterbodies unless approved by the MH environmental officer.
PA-8.06	Stockpiled materials from grubbing will not block natural drainage patterns.
PA-8.07	Unless required for the work, grubbing will be minimized to the extent possible.
PA-8.08	When not under frozen conditions, erosion and sediment control measures will be put in place in accordance with the Erosion and Sediment Control Plan prior to grubbing in accordance with the Erosion and Sediment Control Plan.
PA-8.09	Windrows of grubbed materials will be piled at least 15 m from standing timber.
PA-8.10	If grubbing is needed on a Manitoba Infrastructure (MI) right-of-way, clearance must be obtained from MI in advance.

Hazardous materials (EI-4)	
ID	Mitigation
EI-4.01	A contractor specific Hazardous Substances Management Plan will be prepared by the contractor; approved by the MH environmental officer prior to construction and updated annually.
EI-4.02	Access to hazardous materials storage areas will be restricted to authorized and trained contractor and Manitoba Hydro personnel.
EI-4.03	An inventory of WHMIS controlled substances will be prepared by the contractor and maintained at each project site and updated as required by provincial legislation.
EI-4.04	Bulk waste oil will be stored in approved aboveground tanks provided with secondary containment in accordance with provincial legislation.
EI-4.06	Contractor personnel will be trained and certified in the handling of hazardous materials including emergency response procedures in accordance with provincial legislation.
EI-4.07	Contractor personnel will receive WHMIS training in accordance with provincial legislation.
EI-4.08	Controlled substances will be labeled in accordance with WHMIS requirements. Required documentation will be displayed and current Materials Safety Data Sheets will be available at each project site in accordance with the Hazardous Substances Management Plan.
EI-4.09	Empty hazardous waste containers will be removed to a licensed or approved disposal site by the contractor.
EI-4.10	Hazardous materials storage sites will be secured, and signs will be posted that include hazard warnings, contacts in case of a release, access restrictions and under whose authority the access is restricted.

Hazardous materials (EI-4)	
EI-4.13	Hazardous substances management procedures will be communicated to all project staff and a copy will be made available at the project site.
EI-4.14	Hazardous substances storage areas including coke materials for ground electrode facilities will be located a minimum of 100 m from the ordinary high water mark of a waterway and above the 100-year flood level.
EI-4.16	Hazardous waste materials will be segregated and stored by type in approved containers within a secondary containment system.
EI-4.17	Indoor storage of flammable and combustible substances will be in fire resistant and ventilated enclosed storage area or building in accordance with national codes and standards.
EI-4.19	Non-hazardous products will be used in place of hazardous substances to the extent possible.
EI-4.20	Orientation for contractor and Manitoba Hydro employees working in construction areas will include hazardous substance awareness.
EI-4.21	Pesticide storage will be in accordance with provincial legislation.
EI-4.22	The contractor will be responsible for the safe use, handling, storage and disposal of hazardous materials including waste as well as procedures for emergency conditions in accordance with provincial and federal legislation and standards.
EI-4.23	The contractor will monitor containers of hazardous substance containers regularly for leaks and to ensure that labels are legible and prominently displayed.
EI-4.24	The MH Environmental Officer /Inspector will make routine inspections of hazardous substance storage sites to confirm that environmental protection measures are implemented and effective.

Hazardous materials (EI-4)	
EI-4.25	Waste oil will be transported by licensed carriers to licensed or approved waste oil recycling facilities.
EI-4.26	Wet batteries will be stored and transported to licensed or approved waste recycling facilities.
EI-4.27	Hazardous waste can be stored temporarily for no longer than 30 days before removal to a licensed or approved disposal site.
EI-4.28	Temporary hazardous material storage containers will be located on level ground and within a structure that is covered by roofing preventing precipitation from entering the storage area or the secondary containment system

Heritage resources (EC-5)	
ID	Mitigation
EC-5.01	All archaeological finds discovered during site preparation and construction will be left in their original position until the project archaeologist is contacted and provides instruction.
EC-5.02	Construction activities will not be carried out within established buffer zones for heritage resources except as approved by the project archaeologist.
EC-5.03	Environmental protection measures for heritage resources will be reviewed with the contractor and employees prior to commencement of any construction activities.
EC-5.04	Orientation for project staff working in construction areas will include heritage resource awareness and training including the nature of heritage resources and the management of any resources encountered.
EC-5.05	Orientation information will include typical heritage resource materials and reporting procedures.
EC-5.06	The contractor will report heritage resource materials immediately to the construction supervisor. Construction activities will cease in the immediate vicinity until the project archaeologist is contacted and provides further instruction.
EC-5.07	The Culture and Heritage Resource Protection Plan will be adhered to during preconstruction and construction activities.
EC-5.08	The MH environmental officer / inspector will inspect borrow pits and other excavations for the presence of heritage resource materials.
EC-5.09	As marshalling yards, borrow sources, temporary work spaces, work camps are identified or route changes required, additional heritage monitoring activities may be required to be conducted prior to approval.

Management measures (MM)	
ID	Mitigation
MM-01	All licenses, permits, contracts, project specifications, guidelines and other applicable documents will be obtained and in the possession of both the contractor and Manitoba Hydro prior to commencement of applicable work.
MM-02	All project participants will ensure that project activities are carried out in compliance with applicable legislation, guidelines and, contractual obligations and environmental protection plan provisions.
MM-03	Environmental concerns will be identified and discussed at planning meetings on an as required basis.
MM-04	Manitoba Hydro will notify First Nation and Metis leadership of active construction schedules, prior to project start-up as per project Communication Plan.
MM-05	Manitoba Hydro will contact local municipal authorities prior to project start-up as per project Communication Plan.
MM-06	Manitoba Hydro will contact local resource users, lodge operators, outfitters and recreational resource users and associations to the extent feasible and practical prior to project start-up as per project Communication Plan.
MM-07	Manitoba Hydro will contact Manitoba Sustainable Development and forest management licence holders prior to clearing regarding timber use opportunities.
MM-08	Manitoba Hydro will meet the contractor at the beginning of each new contract to review environmental protection requirements including mitigation measures, inspections and reporting.
MM-11	Project construction update meetings will be held weekly and include discussion of environmental and safety issues.

Management measures (MM)	
MM-12	Relevant documents including licenses, permits, approvals, legislation, guidelines, environmental protection plans, orthophotos maps, etc. will be made available to project participants.
MM-14	The contractor will obtain all licenses, permits, contracts and approvals other than those that are Manitoba Hydro's responsibility prior to project start-up.
MM-15	The contractor will review terms and conditions of all authorizations, contract specifications, agreements, etc. prior to project start-up or as authorization are acquired and will discuss any questions or concerns with Manitoba Hydro.
MM-16	In areas of active construction the contractor must provide Manitoba Hydro representatives with full and unrestricted access to the ROW and all project related work areas so that inspections can occur.
MM-17	The CEnvPP text and map book will available at active construction project sites.
MM-18	The contractor's environment officer is responsible for the delineation and flagging of all identified project environmentally sensitive sites as per CEnvPP.
MM-19	The contractor must submit all contractor developed environmental plans to Manitoba Hydro before work on the project can commence, the plan may be updated as required.
MM-20	Aside from service animals, pets are not permitted on active construction project sites.
MM-21	Affected private landowners and Crown land encumbrance holders will be notified in advance of the schedule for construction, operation and maintenance.
MM-22	Temporary work spaces are prohibited from being placed within ESS without written approval from Manitoba Hydro , exceptions may be subject to Sustainable Development approval

Marshaling yards (PC-5) [If applicable]	
(These measures may also apply to Fly yards, Temporary work spaces, Staging areas, Material placement areas etc.)	
ID	Mitigation
PC-5.01	Contractor employees responsible for receipt and distribution of hazardous substances will be trained in handling and transportation of dangerous goods, and WHMIS.
PC-5.02	Emergency Preparedness and Response Plan and procedures for marshaling yards will be developed.
PC-5.03	Erosion, sediment control and drainage management measures will be put in place in accordance with Erosion and Sediment Control Plan.
PC-5.04	Fire breaks will be established a minimum of 6 m around marshaling yards in areas where there is a risk of fire.
PC-5.05	Garbage and debris will be stored in approved containers, sorted for recycling and disposed of at a licensed or approved waste management facilities site.
PC-5.06	Hazardous materials entering and leaving the marshaling yards will be inventoried and accounted for.
PC-5.07	Hazardous materials will be stored in accordance with provincial legislation, and provincial and national codes and standards.
PC-5.08	Marshaling yards will be located based on criteria that consider soil type, topography, land form type, wildlife habitat and other environmental factors.
PC-5.09	Marshaling yards will be located in existing clearings or natural openings.

Marshaling yards (PC-5) [If applicable]	
PC-5.10	Marshaling yards will be located, constructed, operated and decommissioned in accordance with contract specifications and in accordance with the Rehabilitation and Invasive Species Management Plan.
PC-5.11	Once marshaling yards are no longer required, structures, equipment, materials, fences, etc. will be dismantled and moved to storage or a new location.
PC-5.12	Organic material, topsoil and sub-soil stripped during site preparation will be stockpiled separately for later use in site rehabilitation.
PC-5.13	Petroleum products will only be stored, handled and dispensed in designated areas within marshaling yards in accordance with provincial legislation and guidelines.
PC-5.14	Spill control and clean-up equipment to be located at designated areas within marshaling yards.
PC-5.16	Vegetation control at marshaling yards will be in accordance with Rehabilitation and Invasive Species Management Plan.
PC-5.17	Vehicle, machinery and equipment maintenance and repairs will be carried out in designated areas within marshaling yards.
PC-5.18	Hazardous waste materials, fuel containers and other materials will be stored in approved containers and transported to licensed or approved waste management facilities by a licensed carrier.
PC-5.19	Welding mats will be used to minimize the risk of fire.
PC-5.20	The MH environmental specialist will inspect rehabilitated marshaling and work storage areas in accordance with the Rehabilitation and Invasive Species Management Plan to assess the success of re-vegetation and to determine if additional rehabilitation is required.

Marshaling yards (PC-5) [If applicable]	
PC-5.21	The contractor will assess lands required for marshaling yards, camps or petroleum storage, dispensing areas and hazardous materials storage areas for potential contamination following Canadian Standards Association Environmental Site Assessment (CSA Z768- 01) procedures.
PC-5.22	As marshalling yards, borrow sources, temporary work spaces, work camps are identified or route changes required, additional heritage monitoring activities may be required to be conducted prior to approval.

Petroleum products (EI-5)	
ID	Mitigation
EI-5.01	Aboveground tanks will be equipped with overfill protection, spill containment and collision protection as per legislation.
EI-5.02	All aboveground petroleum product tanks with a capacity greater than 5,000 L will be registered with Manitoba Sustainable Development and have a valid operating permit posted onsite.
EI-5.03	Construction, installation or removal of petroleum product storage tank systems will only occur under the supervision of a registered licensed petroleum technician.
EI-5.04	Containment measures, such as secondary containment (i.e., double walled bermed liner) will be used at all locations where stationary petroleum product storage tanks are used.
EI-5.05	Contractors will inspect all mobile and stationary equipment using petroleum products on a regular basis to ensure that measures are taken immediately to stop any leakage discovered.
EI-5.06	Fueling of equipment or portable storage tanks will be a minimum of 100 m from the ordinary high-water mark of any waterbody, unless approved by Manitoba Hydro Environmental Officer, additional mitigations measures will apply, including: • Equipment will fuel up prior to moving into these areas so the need to refuel will be minimized. • Two people will be utilized during refueling - one operator at the switch and another operator at the pump. • The person fueling will attend the nozzle at all times during the fueling operation and not lock out the nozzle. • Personnel involved in fueling will be versed in the requirements of the Spill Response Plan. • Once fueling is complete the fuel truck will leave the area immediately.

Petroleum products (EI-5)	
	• All equipment will be inspected for leaks, frayed hoses and loose fittings before operating. • Large sized spill kit will be present onsite during activities and crews made aware of location of kit and spill procedures.
EI-5.07	Fuelling operations require the operator to visually observe the process 100% of the time.
EI-5.08	Containment areas (berms/dykes/trays, etc.) will be dewatered after precipitation events and the containment water disposed of as specified in contract specifications.
EI-5.10	Only approved aboveground petroleum storage tanks will be used during the construction phase of the project. No underground tanks will be permitted.
EI-5.11	Orientation for contractor and Manitoba Hydro employees working in construction areas will include petroleum product storage and handling awareness.
EI-5.13	Petroleum product inventories will be taken weekly by the owner/operator on all aboveground tanks greater than 5,000 L and retained for inspection by Manitoba Hydro or Manitoba Sustainable Development upon request.
EI-5.14	Petroleum product storage containers in excess of 230 L will be located on level ground and will incorporate secondary containment with a capacity of 110% of the largest container volume. Water collected in the containment shall be removed regularly so as not to diminish the capacity of the containment.
EI-5.15	Petroleum product storage sites and mobile transportation units will be equipped with fire suppressant equipment and products.
EI-5.16	Petroleum product storage tanks will have adequate collision protection.
EI-5.17	Petroleum product storage and equipment servicing areas will be located a minimum of 100 m from waterbodies, riparian areas or wetlands.

Petroleum products (EI-5)	
EI-5.18	Petroleum products stored outside will be in waterproof and labeled containers, placed on spill containment pallets.
EI-5.20	Petroleum products will display required signage, placards and labeling, and will be transported, handled and stored in accordance with provincial legislation.
EI-5.21	Petroleum products will only be stored and handled within designated areas at construction camps and marshaling yards.
EI-5.22	Portable petroleum product storage containers will be placed on spill trays with a capacity of 110% of the largest container when not in use. Accumulated precipitation collected in the containment shall be removed regularly so as not to diminish the capacity of the containment.
EI-5.23	Slip tanks and barrels will be securely fastened to the vehicle during transport and fuelling operations.
EI-5.24	Spill control and clean-up equipment and materials will be available at all petroleum product storage and dispensing locations.
EI-5.26	The contractor will be responsible for the safe use, handling, storage and disposal of petroleum products including waste as well as procedures for emergency conditions in accordance with provincial and federal legislation and standards.
EI-5.27	The contractor will inspect all petroleum product storage tanks and containers regularly for leaks, and product inventories will be recorded and retained for inspection by Manitoba Hydro and Manitoba Sustainable Development.
EI-5.28	Ignition sources (i.e. smoking) must be at least 7.5m from petroleum product storage areas.

Petroleum products (EI-5)	
EI-5.29	Transfer of petroleum products between storage areas and work sites will not exceed daily requirements and will be in accordance with provincial legislation and guidelines.
EI-5.30	Used petroleum products (including empty containers) will be collected and transported to a licensed oil recycling facility in approved storage containers.
EI-5.31	Vehicles hauling petroleum products will carry equipment and materials for emergency spill containment and clean-up.
EI-5.32	Warning signs will be posted in visible locations around petroleum product storage areas. Signs will indicate hazard warning, contact in case of a spill, access restrictions and authority.
EI-5.33	All slip tanks are to meet ASTM or ISO or CSA or FMCSA (Federal Motor Carrier Safety Administration) certification.
EI-5.34	Drip containers will be placed beneath all Slip tank nozzles when not in use and regularly monitored, any accumulation removed and appropriately disposed.
EI-5.35	Nozzles used for dispensing petroleum products will have their lever catches removed so that the operator will be present while product is being dispensed.
EI-5.36	When a spill or release is identified, it shall be flagged off to prevent disruption of that area until clean up takes place.
EI-5.37	The contractor is responsible for reporting a spill to Manitoba Hydro of any quantity within 2 hours, with a written report due in 24 hours.
EI-5.38	In the case of an externally reportable spill, the contractor is required to contact an MH Environmental Officer /Inspector immediately

Potable water (EI-11)	
ID	Mitigation
EI-11.01	Drinking water holding tanks will be designed for potable water containment.
EI-11.02	Drinking water holding tanks will be cleaned and disinfected before use.
EI-11.03	Potable water used to fill the drinking water holding tanks will be in compliance with federal legislation.
EI-11.05	Leaking fixtures will be repaired in a timely manner.

Rehabilitating and re-vegetation (PA-9)	
ID	Mitigation
PA-9.01	Construction areas no longer required will be re-contoured, stabilized, re-vegetated and restored to near natural conditions in accordance with Rehabilitation and Invasive Species Management Plan.
PA-9.02	Natural re-vegetation will be allowed to occur although active rehabilitation programs may be required at specific sites where erosion warrants seeding or planting.
PA-9.03	Organic material, topsoil and subsoil stripped from construction areas will be stockpiled and protected to be used for future site rehabilitation.
PA-9.04	Rehabilitation of construction areas will incorporate erosion and sediment control measures in accordance with the Erosion and Sediment Control Plan as required.
PA-9.05	Rehabilitation plans will include objectives for restoration of natural conditions, erosion and sediment control, non-native and invasive plant species management, wildlife habitat restoration and restoration of aesthetic values as required.
PA-9.06	Where appropriate, regional native grass mixtures will be used to assist re-vegetation of disturbed areas to control erosion or prevent invasion of non-native species. The mixtures will not contain non-native or invasive species.

Rights-of-way (PC-8)	
ID	Mitigation
PC-8.01	Access to transmission line rights-of-way for clearing and construction will utilize existing roads and trails to the extent possible.
PC-8.02	Access to transmission line rights-of-way will be closed, signed and/or controlled in accordance with an Access Management Plan.
PC-8.03	Additional clearing outside established rights-of-way is subject to Manitoba Sustainable Development approval.
PC-8.04	Clearing and disturbance will be limited to defined rights-of-way and associated access routes to the extent possible.
PC-8.05	Clearing of rights-of-way will occur under frozen or dry ground conditions to minimize rutting and erosion.
PC-8.06	Construction equipment will be wide-tracked or equipped with low-ground pressure tires if there is a potential for rutting and/or compaction to surface soils.
PC-8.07	Disturbed areas along transmission line rights-of-way will be rehabilitated in accordance with site Rehabilitation and Invasive Species Management Plan.
PC-8.08	Environmentally sensitive sites, features and areas will be identified and mapped prior to clearing.
PC-8.09	In situations where the ROW doesn't have completely frozen or dry ground conditions alternate products such as construction mats may be used as per the contract specifications.
PC-8.10	Contractors are to develop wet weather protocols that provide for mitigation measures to be implemented when wet soil conditions exist (see wet soil section

Rights-of-way (PC-8)	
PC-8.11	Temporary work spaces are prohibited from being placed within ESS without written approval from Manitoba Hydro , exceptions may be subject to Sustainable Development approval

Soil contamination (EI-7)	
ID	Mitigation
EI-7.01	A closure report will be prepared for completed soil remediation projects in accordance with provincial guidelines.
EI-7.02	A remediation plan will be prepared by the contractor and submitted to MH environmental officer for sites contaminated by project activities and will remediate soils according to provincial standards.
EI-7.03	All spills and releases reported will be responded to in accordance with provincial legislation and Manitoba Hydro external reporting requirements. (Refer to Appendix K).
EI-7.04	Any contaminated soil treatment areas must be designed and constructed to contain surface runoff and prevent leaching to soil and groundwater.
EI-7.05	Contractor personnel will take all reasonable steps to prevent soil, groundwater and surface water contamination.
EI-7.07	Upon completion of impacted soil removal, confirmatory samples will be taken from the spill area to ensure that remedial activities are complete. No backfilling can commence before sample results meet applicable guidelines. Only clean fill shall be used for backfilling.
EI-7.10	The contractor will assess lands required for marshaling yards, camps or petroleum storage, dispensing areas and hazardous materials storage areas for potential contamination following Canadian Standards Association Environmental Site Assessment (CSA Z768- 01) procedures.
EI-7.11	The contractor will carry out a CSA Phase I Environmental Site Assessment (CSA Z768-01) at abandoned construction camps, marshaling yards, petroleum product storage, dispensing areas and hazardous materials storage areas if contamination is suspected by MH environmental officer. If required Phase II Environmental Site Assessment (CSA Z769-00) will be conducted by contractor.

Soil contamination (EI-7)	
EI-7.12	The MH environmental officer / inspector will inspect contaminated site assessment and remediation work regularly to confirm that environmental protection measures are implemented and effective.
EI-7.13	When a spill or release is identified, it shall be flagged off to prevent disruption of that area until clean up takes place.

Stripping (PA-10)	
ID	Mitigation
PA-10.01	Construction areas containing soil with high silt content, artesian springs or areas of previous erosion will receive special erosion and sediment control techniques in accordance with the Erosion and Sediment Control Plan.
PA-10.02	Erosion and sediment control measures will be put in place prior to stripping in accordance with the Erosion and Sediment Control Plan as required.
PA-10.03	In areas of known salinity, excavated or stripped soil will be stored on liners or in designated areas were possible.
PA-10.04	Mineral topsoils and surficial organic materials should be stripped separately from subsoils, segregated, and stockpiled for later use in backfilling, contouring and rehabilitation. When soils are backfilled, they are to be replaced in the same order from which they were removed.
PA-10.05	Stockpiled materials from stripping will not block natural drainage patterns.
PA-10.07	Stripping will not be permitted within established buffer zones and setback distances from waterbodies except where approved in work permits, authorizations or contract specifications.
PA-10.08	The contractor will stabilize construction areas requiring extensive stripping as soon as possible to minimize erosion.

Transmission towers and conductors (PC-10)	
ID	Mitigation
PC-10.01	Areas where soil was disturbed will be stabilized and re-vegetated with low growth vegetation as soon as practical.
PC-10.02	During tower foundation excavation the A horizon soils (black or dark in color/organic layer) shall be stripped and stored separately from other soils. When back filling, these soils are to be replaced as the surface soils to encourage site re-vegetation.
PC-10.03	Excavations required for tower installations will be restricted to the minimum required footprint.
PC-10.04	The construction supervisor will issue a stop work order if extreme wet weather conditions result in soil damage from rutting and erosion is resulting in sedimentation of adjacent waterbodies.

Vehicle and equipment maintenance (EI-9)	
ID	Mitigation
EI-9.01	An Emergency Preparedness and Response Plan and spill control and clean-up equipment will be provided at all designated vehicle, equipment and machinery maintenance areas.
EI-9.02	Vehicle, equipment and machinery maintenance repair procedures will include containing waste fluids and will use preventative measures such as spill trays and tarps where required.
EI-9.03	Unnecessary idling of vehicles, equipment and machinery will be avoided to the extent practical.
EI-9.04	Vehicle, equipment and machinery maintenance, washing and repairs will be carried out in designated areas located at least 100 m from the ordinary high water mark of a waterbody, riparian area or wetland.
EI-9.05	Vehicle, equipment and machinery operators will perform a daily inspection for fuel, oil and fluid leaks and will immediately shutdown and repair any leaks found. All machinery working near watercourses will be kept clean and free of leaks.
EI-9.06	Vehicles transporting dangerous goods or hazardous products will display required placards and labeling in accordance with provincial legislation.
EI-9.07	Vehicles, equipment and machinery must arrive on site in clean condition of fluid leaks and weed seeds. Detailed cleaning inspection records for each piece of machinery must be provided prior to mobilization on site. Sample forms can be provided.
EI-9.08	Vehicles, equipment and machinery that carry fuel, hydraulic oil and other petroleum products will also carry spill control and clean-up equipment and materials.

Waste management (EI-10)	
ID	Mitigation
EI-10.01	A Waste and Recycling Management Plan will be developed, prior to construction and updated annually.
EI-10.02	Animal-proof garbage containers with regular removal of food waste to approved waste management facility grounds will be used to manage food waste.
EI-10.03	Construction sites will be kept tidy at all times and bins will be provided wherever solid wastes are generated.
EI-10.04	Indiscriminate burning, dumping, littering or abandonment will not be permitted.
EI-10.06	Waste materials will be collected and transported to a licensed or approved waste management facility in accordance with the Waste and Recycling Management Plan.
EI-10.07	Waste materials remaining at snow disposal sites after melting will be disposed of at a licensed or approved landfill.

Wastewater (EI-12)	
ID	Mitigation
EI-12.01	All sewage haulers will be registered with the Manitoba Sustainable Development. A copy of the hauler registration will be provided to MH environmental officer / inspector upon request.
EI-12.02	Wastewater holding tanks will be installed as per provincial legislation and regulation and a minimum of 100 m from the ordinary high water mark of any waterbody.
EI-12.03	Wastewater will be removed from holding tanks when they are no more than 90% full by a registered sewage hauler and disposed of at a licensed wastewater treatment facility.
EI-12.04	Sewage and grey water will be collected in holding tanks and chemical toilets.

Water crossings (PC-9)	
ID	Mitigation
PC-9.01	Access road crossings will be at right angles to waterbodies to the extent possible.
PC-9.02	Riparian buffers shall be a minimum of 30 m and increase in size based on slope of land entering waterway (see riparian buffer table in CEnvPP). Within these buffers shrub and herbaceous understory vegetation will be maintained along with trees that do not violate Manitoba Hydro vegetation clearance requirements.
PC-9.03	Construction vehicles and equipment will not be permitted in designated machine-free zones except at designated crossings.
PC-9.04	Construction of stream crossings will follow the *Manitoba Stream Crossing Guidelines For The Protection of Fish and Fish Habitat* (DFO and MNR 1996).
PC-9.05	Ice bridges are constructed of clean water, ice and snow and snow fills are constructed of clean snow. Materials such as gravel, rock and loose woody material are cannot be used. Crossings cannot impede water flow at any time of the year.
PC-9.06	The withdrawal of any water will not result in reduction in the wetted width of a stream, in order to maintain existing fish habitat. Water flow is maintained under the ice, where this naturally occurs, and If water is being pumped from a lake or river to build up the ice bridge, the intakes are sized and adequately screened to prevent debris blockage and fish mortality.
PC-9.07	Where logs are required for use in stabilizing shoreline approaches, they are clean and securely bound together, and they are removed either before or immediately following work or before the spring freshet.
PC-9.08	When the crossing season is over and where it is safe to do so, create a v-notch in the centre of the ice bridge to facilitate water flow and also to

Water crossings (PC-9)	
	prevent blocking fish passage, channel erosion and flooding. Compacted snow and all crossing materials will be removed prior to the spring freshet.
PC-9.09	No logs or woody debris are to be left within the water body or on the banks or shoreline where they can wash back into the water body.
PC-9.10	Grading of the stream banks for the approaches should not occur. Establish a single entry and exit. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
PC-9.11	Fording should occur only after authorization from an MH environmental Officer/Inspector. Machinery fording a flowing watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and is to occur only if an existing crossing at another location is not available or practical to use. One-time fording will be timed to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows and will not be permitted to occur in areas that are known fish spawning sites.
PC-9.12	Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding, the channel width at the crossing site is no greater than 5 metres from ordinary high water mark to ordinary high water mark.
PC-9.13	In watercourses where mussel species of conservation concern are known to occur, watercourse crossings may occur by boat or barge, or during winter (i.e., under frozen conditions) to prevent mortality of the mussels.
PC-9.14	The contractor is responsible for having signage at each end of any ice bridges indicating the ice thickness and the date it was last measured.
PC-9.15	Cleared trees and woody debris will not be pushed into (or adjacent) to standing timber, or within the high-water mark of wetlands or waterbodies
PC-9.16	The contractor requires approval from a Manitoba Hydro Environmental Officer prior to withdrawing water from any waterbody. The withdrawal of

Water crossings (PC-9)	
	water from a waterbody will not reduce water levels to the point of exceeding that waterbody's ability to sustain an active beaver lodge
Wetlands (EC-8)	
ID	Mitigation
EC-8.01	Clearing wastes and other construction debris or waste will not be placed in wetland areas. Existing logs, snags and wood debris will be left in place.
EC-8.02	Wetland areas will be prescribed riparian buffers in site specific mitigation tables in which understory low-growth vegetation will be maintained where possible. Environmental protection measures for working in and around wetlands will be reviewed with the contractor and employees prior to commencement of any construction activities.
EC-8.03	Natural vegetated buffer areas of 30 m will be established around wetlands and riparian zones will be maintained to the extent possible.
EC-8.04	Disturbance of wetlands will only be carried out under frozen ground conditions. If frozen ground conditions don't exist alternate mitigation measures such as construction matting may be used to minimize surface damage, rutting and erosion if approved by MH environmental officer / inspector.
EC-8.05	Cleared trees and woody debris will not be pushed into (or adjacent) to standing timber, or within the high-water mark of wetlands or waterbodies

Wildlife protection (EC-9)	
ID	Mitigation
EC-9.01	Any injured or killed wildlife encountered on the transmission line ROWs and associated access roads/trails will be reported to Manitoba Sustainable Development.
EC-9.02	Bird Diverters or aerial markers may be installed in high bird traffic areas.
EC-9.03	Boundaries of important wildlife habitats (i.e. mineral licks and stick nests) will be identified in mapsheets and flagged prior to clearing.
EC-9.04	Clearing and construction activities are allowed only within the reduced risk time period for wildlife illustrated (in Appendix C). If clearing within the sensitive time period for wildlife, further mitigation and approvals would be required.
EC-9.06	Animal-proof garbage containers with regular removal of food waste to approved waste management facility will be used to manage food waste.
EC-9.07	Hunting and harvesting of wildlife by project staff will not be permitted while working on the project sites.
EC-9.09	If animal traps or bait sites are encountered within the project footprint they are to be removed for the safety of workers and construction equipment. If found on private land, the landowner will be contacted and have the materials returned to them. If found on Crown land the materials will be released to Manitoba Sustainable Development.
EC-9.10	Prior to seeking authorization from Manitoba Sustainable Development (MSD) for removal of a Muskrat house, Beaver Dam or Lodge documentation of reasonable attempts to trap resident beavers/muskrat must be provided. Attempts to trap resident Beavers/muskrats must be undertaken by a licensed trapper or person with a valid Wild Animal Kill Permit.

Wildlife protection (EC-9)	
EC-9.11	No firearms will be permitted at construction sites.
ID	Mitigation
EC-9.12	Orientation for contractor and Manitoba Hydro employees will include awareness of environmental protection measures for wildlife and wildlife habitat.
EC-9.13	Problem wildlife will be reported immediately to Manitoba Sustainable Development.
EC-9.15	Trees containing large nests of sticks and areas where active animal dens or burrows are encountered will be left undisturbed until unoccupied. Artificial structures for nesting may be provided if unoccupied nests must be removed.
EC-9.16	Vehicles will not exceed posted speed limits and wildlife warning signs may be installed in high density areas and at known crossings locations as a result of wildlife monitoring.
EC-9.18	Wildlife and wildlife habitat will be protected in accordance with provincial and federal legislation and provincial and federal guidelines.
EC-9.19	Wildlife will not be fed, befriended or harassed.
EC-9.22	New by-pass trails and access routes will be sited where possible to utilize existing natural terrain features and existing vegetation to minimize line of site.
EC-9.23	New occurrences of any listed rare, threatened or endangered species will be documented and provided to Manitoba Sustainable Development.
EC-9.24	In watercourses where mussel species of conservation concern are known to occur, watercourse crossings may occur by boat or barge, or during winter (i.e., under frozen conditions) to prevent mortality of the mussels.

Wildlife protection (EC-9)	
EC-9.25	Muskrat house, Beaver Dam or Lodge removal requires consultation with and the Department of Fisheries and Oceans who may require additional authorizations. House, Dam or Lodge removal may require heavy equipment or explosives which would require an additional Work Permit from Sustainable Development when located on Crown Land.
EC-9.26	The contractor requires approval from a Manitoba Hydro Environmental Officer prior to withdrawing water from any waterbody. The withdrawal of water from a waterbody will not reduce water levels to the point of exceeding that waterbody's ability to sustain an active beaver lodge

Map sheets and mitigation tables

The map sheets and specific mitigation tables are presented in Part 2 in a "map book" format. The map sheets provide an overview of environmentally sensitive sites (ESS), while the associated mitigation tables provide specific mitigation requirements related to these ESS.

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6.0 References

DFO. 1995. Freshwater intake end-of-pipe fish screen guidelines. Department of Fisheries and Oceans. Published by: Communications Directorate, Department of Fisheries and Oceans, Ottawa, Ontario.

DFO and MNR. 1996. Manitoba stream crossing guidelines for the protection of fish and fish habitat. Fisheries and Oceans Canada and Manitoba Natural Resources.

MWS. 2011. Manitoba water quality standards, objectives and guidelines. Manitoba Water Stewardship Report 2011-01. Water Science and Management Branch, Manitoba Water Stewardship.

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PART 2

Construction environmental protection plan Mapbook

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APPENDICES

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Appendix A: Contact list

Contact	Name	Phone Number(s)
Construction contractor		
Contractor project manager		
Contractor field lead		
Contractor safety		
Environmental representative		
Manitoba Hydro		
Project engineer		
Construction supervisor		
Senior environmental assessment officer		
environmental officer / inspector		
FSO: field safety officer		
Hazardous materials officer		
Area spill response coordinator		
Emergency response services		
Project archaeologist (primary contact)		
Manitoba Sustainable Development contacts		
24 hr environmental emergency response reporting line		1-204-944-4888 or Toll free at 1-855-944-4888
District office		
First Nations and Metis contacts		

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Appendix B: Environmental licences, approvals and permits

List of Potential Approvals required for Construction		
Approval required (Applicable Legislation / Regulation)	Type of Approval needed	Responsibility
Environment Act Licence (Class 2)	Licence	TD&EE
Crown Lands Act (General Permit)	Permit	Property Dept.
Storage and Handling of Gasoline and Associated Products Regulation, Generator Registration and Carrier Licencing Regulation (Dangerous Goods Handling and Transportation Act)	Permit	Contractor
Highways Protection Act	Permit	TLCC
The Heritage Resources Act (when required)	Permit	TD&EE
A permit from Manitoba Infrastructure is required for any construction above or below ground level that falls within 250 ft. of a Provincial Trunk Highway right-of-way edge or within 150 ft. of a Provincial Road right-of-way edge.	Permit	Property Dept.
Note: Permits, Licences and Approvals are the sole responsibility of those groups indicated in this table		
TD&EE – Manitoba Hydro Transmission & Distribution Environment and Engagement Department		
TLCC – Transmission Line and Civil Construction Department		

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Manitoba
Sustainable Development

Environmental Stewardship Division
Environmental Approvals Branch
123 Main Street, Suite 160, Winnipeg, Manitoba R3C 1A5
T 204 945-8321 F 204 945-5229
www.gov.mb.ca/conservation/eal

CLIENT FILE NO.: 5719.00

January 30, 2017

Shannon Johnson
Manitoba Hydro
820 Taylor Avenue
Winnipeg MB R3M 3T1

Dear Ms. Johnson:

Enclosed is **Environment Act Licence No. 3207** issued to **Manitoba Hydro** for the construction, operation, and decommissioning of the St. Vital Transmission Complex project, which includes a new 119 km long, 230 kV transmission line extending from the St. Vital Station located near the intersection of Bishop Grandin and Lagimodiere boulevards to the Letellier Station near Letellier, Manitoba, and a 37 km long, 230 kV transmission line extending the St. Vital Station to the La Verendrye Station located near Oak Bluff, Manitoba.

In addition to the enclosed Licence requirements, please be informed that all other applicable federal, provincial and municipal regulations and by-laws must be complied with. A Notice of Alteration must be filed with the Director for approval prior to any alteration to the Development as licensed.

For further information on the administration and application of the Licence, please feel free to contact Yvonne Hawryliuk, Environment Officer at 204-945-5305.

Pursuant to Section 27 of *The Environment Act*, this licensing decision may be appealed by any person who is affected by the issuance of this Licence to the Minister of Sustainable Development within 30 days of the date of the Licence.

Yours truly,

Tracey Braun

Tracey Braun, M.Sc.
Director
Environment Act

c: Don Labossiere, D. Smiley, Y.Hawryliuk, Environmental Compliance and Enforcement
Public Registries
Public Distribution List (att.) .../2

NOTE: **Confirmation of Receipt of this Licence No. 3207 *(by the Licencee only)* is required by the Director of Environmental Approvals. Please acknowledge receipt by signing in the space provided below and faxing a copy (letter only) to the Department by February 15, 2017**

On behalf of Manitoba Hydro **Date**

****A COPY OF THE LICENCE MUST BE KEPT ON SITE AT THE DEVELOPMENT AT ALL TIMES****

Public Distribution List
St. Vital Transmission Project Environment Act Licence 3207

Frank Capasso
Myron Knodel
Don Doerksen
Jay J Amell
Jay Myshkowsky
Alex Sotiriadis
Greg Wolitski
Jennifer Ham
Van Ngo
Chris Bohemier
Antonina and Patrick De Pau
Nicole Hartleb
Angela Taylor
Ashley Davis
Beverley Hedley-Kippen
Scott Loepp
Patrick Macchia
SC Spak
David Bastable
Dave & Michelle Wowchuk
Jessica Keus
Brigitte L
Dale LaMonica

THE ENVIRONMENT ACT
LOI SUR L'ENVIRONNEMENT

Manitoba

LICENCE

Licence No. / Licence n° 3207

Issue Date / Date de délivrance January 30, 2017

In accordance with *The Environment Act* (C.C.S.M. c. E125) / Conformément à *la Loi sur l'environnement* (C.P.L.M. c. E125)

Pursuant to Section 11(1) / Conformément au Paragraphe 11(1)

THIS LICENCE IS ISSUED TO: / CETTE LICENCE EST DONNÉE À:

MANITOBA HYDRO;
"the Licencee"

for the construction, operation, and decommissioning of the St. Vital Transmission Complex project, which includes a new 119 km long, 230 kV transmission line extending from the St. Vital Station located near the intersection of Bishop Grandin and Lagimodiere boulevards to the Letellier Station near Letellier, Manitoba, and a 37 km long, 230 kV transmission line extending the St. Vital Station to the La Verendrye Station located near Oak Bluff, Manitoba in accordance with the Proposal filed under The Environment Act, dated May 30, 2014, supporting information filed in association with the Proposal dated October 6, 2014, and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence:

"affected area" means a geographical area, excluding the property of the Development;

"Director" means an employee so designated pursuant to *The Environment Act*;

"Environment Officer" means an employee so designated pursuant to *The Environment Act;*

"noise nuisance" means an unwanted sound, in an affected area, which is annoying, troublesome, or disagreeable to a person:

a) residing in an affected area;
b) working in an affected area; or

c) present at a location in an affected area which is normally open to the members of the public;

if the unwanted sound

d) is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director and within a 90 day period, from 5 different persons falling within clauses (a), (b) or (c), who do not live in the same household; or

e) is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses (a), (b) or (c) and the Director is of the opinion that if the unwanted sound had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90 day period from 5 different persons and who do not live in the same household;

"riparian area" means an area of land on the banks or in the vicinity of a waterbody, which due to the presence of water supports, or in the absence of human intervention would naturally support, an ecosystem that is distinctly different from that of adjacent upland areas (*The Water Protection Act* 2005);

"waterbody" means any body of flowing or standing water, whether naturally or artificially created, and whether the flow or presence of water is continuous, intermittent or occurs only during a flood, including but not limited to a lake, river, creek, stream, and wetland (slough, marsh, swamp, etc.), including ice on any of them (*The Water Protection Act* 2005); and

"wetland" means land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity which are adapted to a wet environment. They are generally less than approximately 2 metres in depth (National Wetland Working Group 1997).

GENERAL TERMS AND CONDITIONS

This Section of the Licence contains requirements intended to provide guidance to the Licencee in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

Future Sampling

1. In addition to any of the limits, terms and conditions specified in this Licence, the Licencee shall, upon the request of the Director:
   a) sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, treatment,

handling, disposal or emission systems, for such pollutants or ambient quality, aquatic toxicity, leachate characteristics and discharge or emission rates, for such duration and at such frequencies as may be specified;

b) determine the environmental impact associated with the release of any pollutant(s) from the Development;
c) conduct specific investigations in response to the data gathered during environmental monitoring programs; or
d) provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and analytical procedures being used, bioassay data, flow rate measurements and such other information as may from time to time be requested.

2. The Licencee shall, unless otherwise specified in this Licence:
   a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in the most current edition of Standard Methods for the Examination of Water and Wastewater or in accordance with equivalent preservation and analytical methodologies approved by the Director;
   b) have all analytical determinations undertaken by an accredited laboratory; and
   c) report the results to the Director, in writing and in an electronic format acceptable to the Director, within 60 days of the samples being taken.

Reporting Format

3. The Licencee shall submit all information required to be provided to the Director or Environment Officer under this Licence, in written and electronic format, in such form (including number of copies) and of such content as may be required by the Director or Environment Officer, and each submission shall be clearly labelled with the Licence Number and Client File Number associated with this Licence.

Permits

4. The Licencee shall, prior to the commencement of construction on Crown land, apply for and obtain permits for work to be performed on Crown Lands from Manitoba Sustainable Development and the Crown Land and Property Agency, and comply with the conditions of the permits.

Compliance

5. The Licencee shall adhere to the measures and commitments included in the Proposal, supporting information filed in association with the Proposal, and plans submitted and approved pursuant to this Licence during construction, maintenance, and decommissioning of the Development.

Environmental Inspection

6. The Licencee shall, during construction of the Development, employ qualified environmental inspectors to monitor the work on a daily basis to ensure that all the environmental practices outlined in the Proposal, supporting information, and the plans submitted pursuant to this Licence are carried out.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

Notification

7. The Licencee shall notify the assigned Environment Officer not less than two weeks prior to beginning construction of the Development. The notification shall include the intended starting date of construction and the name of the contractor responsible for the construction.

8. The Licencee shall, prior to construction, provide a copy of this Licence to the contractor and subcontractor(s) involved in the Development.

Water Crossings

9. The Licencee shall, in accordance The Water Resources Administration Act, including sections 2.1 and 14(4), obtain written approval and authorization from the Minister of Infrastructure prior to initiating construction of any portion of the Development on, over, or across a provincial waterway, including but not limited to, the Red River Floodway.

10. The Licencee shall, prior to initiating construction of any portion of the Development across the Red River Floodway at the control structure, enter into a Memorandum of Agreement with the Minister of Infrastructure, with terms and conditions governing the construction and operation of the portion of the Development at this location.

11. The Licencee shall, during construction of the Development, adhere to the general recommendations contained in the Department guidelines titled *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, 1996.*

12. The Licencee shall not undertake work associated with the Development in water or on shorelines between April 1 and June 30 of any given year, or in periods of high stream flow.

13. The Licencee shall, during construction and maintenance of the Development within the riparian areas of fish-bearing waterbodies, potentially fish-bearing waterbodies, and/or waterbodies that contribute to fish bearing waterbodies:
    a) maintain existing low growth vegetation such as grasses, shrubs, and willows to the extent possible;

b) clear trees that must be removed using only low impact methods that do not significantly disturb surface vegetation and soils;
c) prohibit the application of herbicides; and
d) stabilize and re-vegetate disturbed soils with biodegradable erosion control materials and a seed mix native to the area.

Wetlands

14. The Licencee shall carry out construction and maintenance activities associated with the Development within wetlands only during frozen ground conditions.

Foreign Biota

15. The Licencee shall, prior to construction and maintenance of the Development, submit a detailed biosecurity plan for approval of the Director. The plan shall describe measures to be implemented during construction and maintenance of the Development to control the spread of soil borne diseases and invasive species from field to field in agricultural areas.

Clearing

16. The Licencee shall not conduct clearing components of the Development between April 15 and July 31, of each construction year, to avoid potential impacts to the nesting habitat for migratory birds. Should any transmission line clearing be required within this period, the Licencee shall, prior to the construction activity, consult and reach an agreement with the Wildlife Branch regarding the location of any key wildlife habitats to be avoided, including bird nesting and brooding areas.

Heritage Resources

17. The Licencee shall, during construction and operation of the Development, apply measures to protect heritage resources, as directed by the Historic Resources Branch of Manitoba Tourism, Culture, Heritage, Sport, and Consumer Protection, consistent with the Heritage Resources Act, or any future amendment thereof.

Noise Nuisance

18. The Licencee shall not cause or permit a noise nuisance to be created as a result of the construction, operation or alteration of the Development, and shall take such steps as the Director may require to eliminate or mitigate a noise nuisance.

Petroleum Storage and Handling

19. The Licencee shall locate fuel storage and equipment servicing areas established for the construction and operation of the Development a minimum distance of 100 metres from any waterbody, and shall comply with the requirements of the ***Storage***

and Handling of Petroleum Products and Allied Products Regulation 188/2001, or any future amendment thereof.

20. The Licencee shall, during construction and maintenance of the Development, operate, maintain, and store all materials and equipment in a manner that prevents any deleterious substances including fuel, oil, grease, hydraulic fluid, coolant, and other similar substances from contaminating soil or entering any waterbody. Emergency spill kits for both land and in-water use shall be readily available on site during construction.

Waste Disposal

21. The Licencee shall dispose of non-reusable construction debris and solid waste from the construction and maintenance of the Development at a waste disposal ground operating under the authority of a permit issued under ***Waste Disposal Grounds Regulation 150/91***, or any future amendment thereof, or a licence issued pursuant to *The Environment Act*.

Onsite Wastewater Disposal

22. The Licencee shall, during construction of the Development, dispose of all sewage and septage from on-site sanitary facilities in accordance with the ***Onsite Wastewater Management Systems Regulation 83/2003***, or any future amendment thereof.

Pesticide Application

23. The Licencee shall adhere to the policies and procedures for pesticide applications pursuant to ***The Environment Act***, or any future amendment thereof, and regulations thereunder respecting ***Pesticides,*** to minimize the exposure of its employees and the public, as well as non-target biota, to pesticides.

Release of Pollutants

24. The Licencee shall, in the case of physical or mechanical equipment breakdown or process upset where such breakdown or process upset results or may result in the release of a pollutant in an amount or concentration, or at a level or rate of release, that causes or may cause a significant adverse effect, immediately report the event by calling the 24-hour environmental accident reporting line at 204-944-4888 (toll-free 1-855-944-4888). The report shall indicate the nature of the event, the time and estimated duration of the event and the reason for the event.

25. The Licencee shall, following the reporting of an event pursuant to Clause 24,
    a) identify the repairs required to the mechanical equipment;
    b) undertake all repairs to minimize unauthorized discharges of a pollutant;
    c) complete the repairs in accordance with any written instructions of the Director; and

d) submit a report to the Director about the causes of breakdown and measures taken, within one week of the repairs being done.

26. The Licencee shall, during construction and maintenance of the Development, take all appropriate measures to prevent erosion and the deposition of sediment into any waterbodies.

Decommissioning

27. The Licencee shall, prior to decommissioning of the Development, submit for approval of the Director, a decommissioning and rehabilitation plan for the Development.

Respecting Alterations to the Development

28. The Licencee shall obtain written approval from the Director for any proposed alteration to the Development before proceeding with the alteration.

REVIEW AND REVOCATION

A. If, in the opinion of the Director, the Licencee has exceeded or is exceeding or has or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Director may, temporarily or permanently, revoke this Licence.

B. If the Licencee has not commenced construction of the Development within three years of the date of this Licence, the Licence is revoked.

C. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new proposal pursuant to Section 11 of *The Environment Act*.

Tracey Braun

Tracey Braun, M.Sc.
Director
Environment Act

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Appendix C Timing Windows

Project Wildlife Reduced Risk Timing Windows

Species	Sensitivity	January		February		March		April		May		June		July		August		September		October		November		December	
Mammals	Denning Sites																								
Amphibians/Reptiles	Amphibian Bearing Wetland																								
Snakes	Hibernaculum																								
Bats	Hibernaculum																								
Birds	Breeding and Nesting																								
Fish	Spawning Areas																								

Reduced Risk to Wildlife

Sensitive Time Period for Wildlife (Where construction activities occur during this period, mitigations measures will be prescribed on a site by site basis)

Examples of Mitigations that may be approved by Licensing and Environmental Assessment Department during Sensitive Time Period for Birds or Amphibians/Reptiles are found in Appendix.

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Appendix D: Buffers and setbacks

Feature	Activity	Non Frozen Ground Setback Distance[1]	Frozen Ground Setback Distance[1]	Vegetated Buffer Distance[2]
Vegetation				
Plant Species at Risk	Tower Foundation Siting	100m	100m	
	Clearing And Construction	30m		30m
	Maintenance	30m		30m
	Access Trail	30m	30m	
Anthropogenic				
Heritage and Cultural	All	Varies	Varies	Varies
Amphibians				
Northern Leopard Frog (known breeding pond, watering site)	Tower Foundation Siting	30m	30m	
	Clearing And Construction	30m		30m
	Maintenance	30m		
	Access Trail	30m	30m	
Reptiles				
Garter Snake Hibernaculum	Tower Foundation Siting	200m	200m	
Landforms				
Wetlands	Clearing And Construction			30m
	Maintenance			30m
	Access Trail			30m
	Hazardous Material Handling/Storage	100m	100m	
	Soil Stockpiles	30m		30m
Mammals				
Mineral Licks	All	120m		120m

Feature	Activity	Non Frozen Ground Setback Distance[1]	Frozen Ground Setback Distance[1]	Vegetated Buffer Distance[2]
Occupied Mammal Dens[3](Red fox, Gray fox, Coyote, Wolf, Bobcat, American badger, American marten, Fisher, Least weasel and Raccoon)	All	50m	50m	
Occupied Bear Den	All	150m	150m	150m

NOTE: ALL MEASUREMENTS ARE FROM EDGE OF FEATURE

[1]NO WORK ALLOWED WITHOUT MANITOBA HYDRO LICENSING AND ENVIRONMENTAL ASSESSMENT DEPARTMENT REVIEW AND APPROVAL, WHICH MAY BE SUBJECT TO REGULATORY APPROVAL.

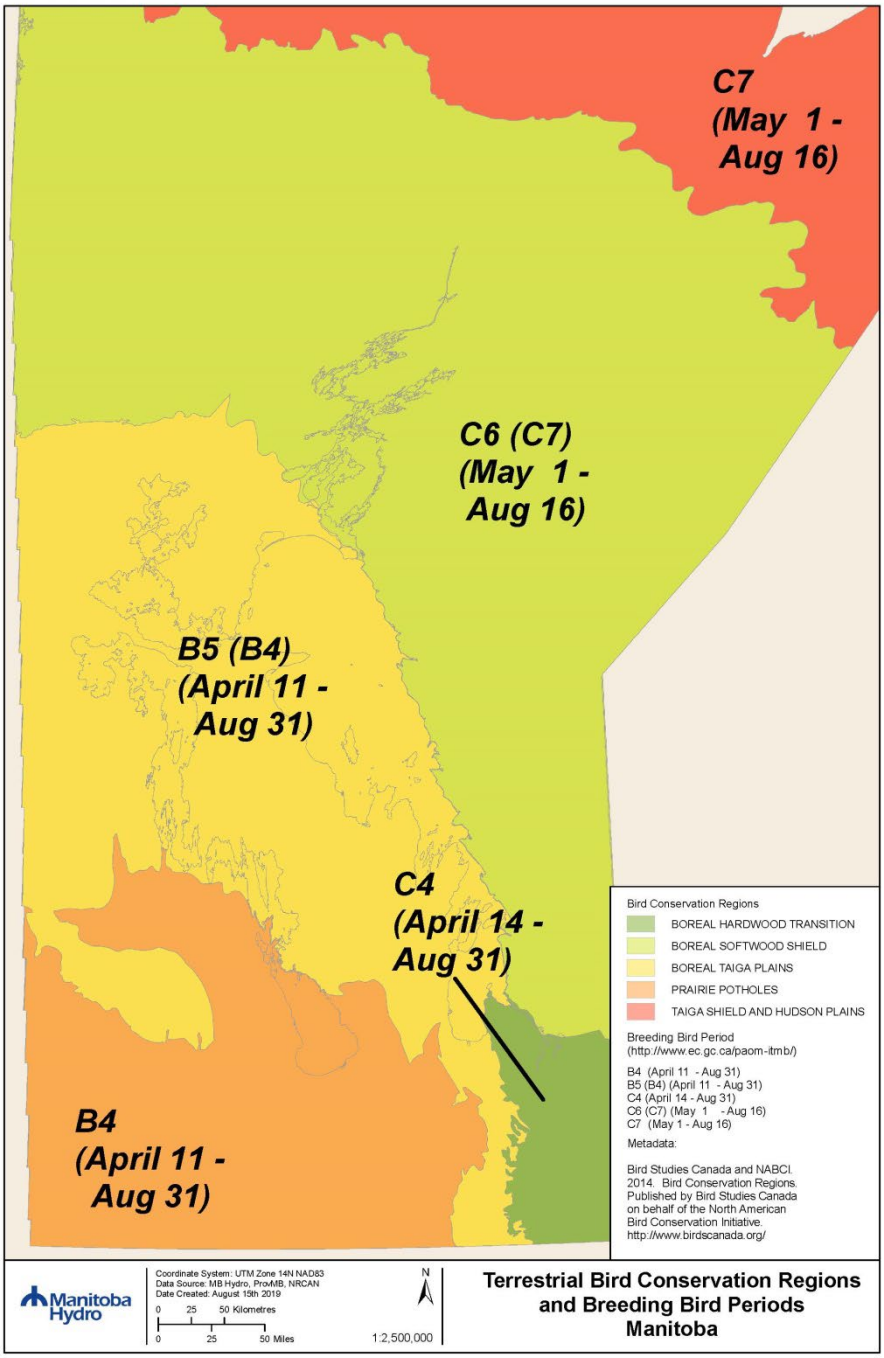
[2]SHRUB AND HERBACEOUS VEGETATION RETAINED)

[3]BEAR/MAMMAL DEN SITES ARE HIGHLY VARIABLE AND MAY BE FOUND IN CAVES, CREVASSES, OVERTURNED TREES, OPEN GROUND NESTS, AND LOW-SWEEPING BRANCHES OF A CONIFEROUS TREE.

Appendix E: Avian Protection Documents

Appendix E-1: Terrestrial Bird Conservation Regions and Breeding Bird Seasons for Manitoba*

* Adapted from Environment and Climate Change. Dates should be considered as guidelines.



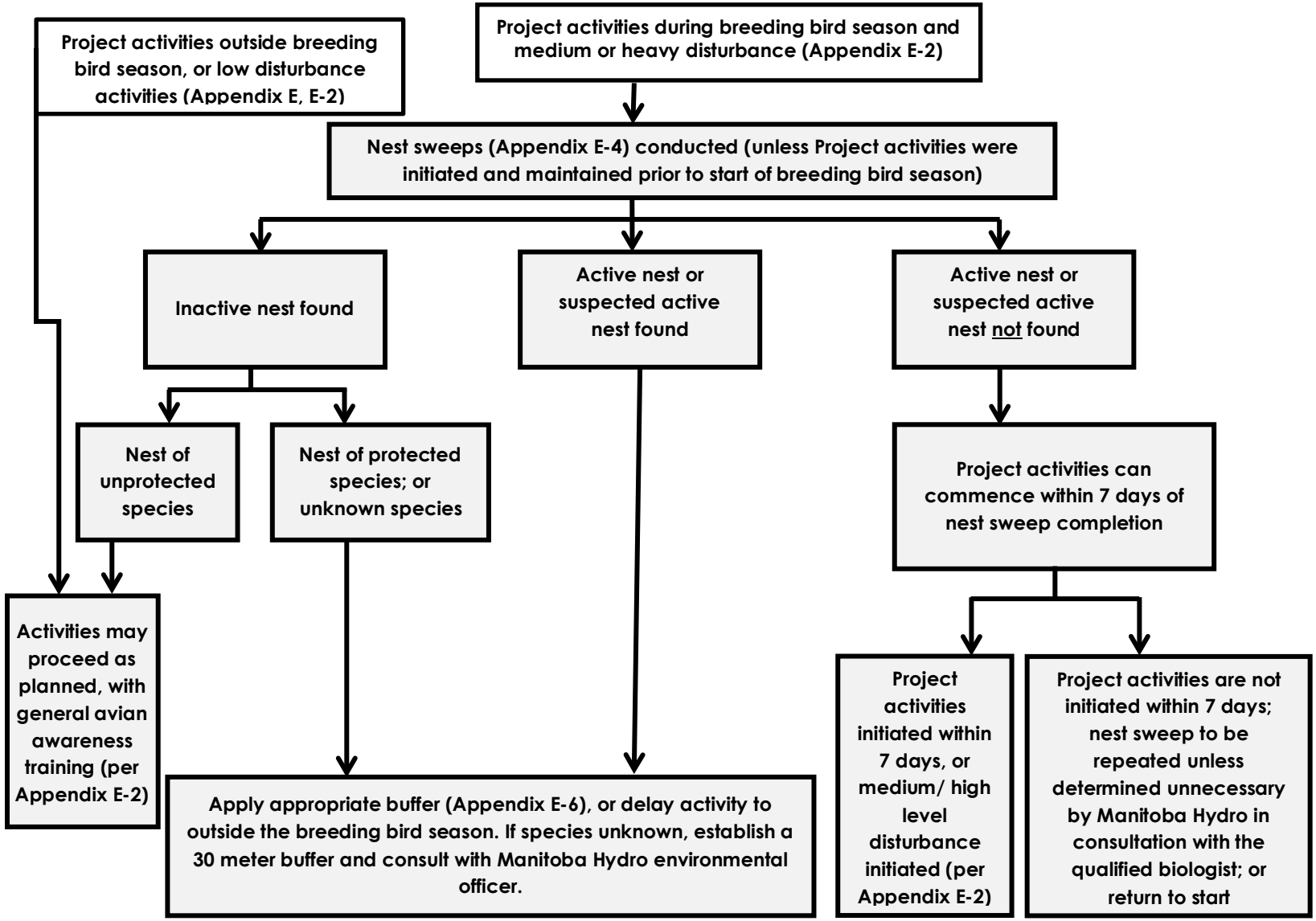
Appendix E-2: Determining Disturbance Level for Nesting Birds during Breeding Bird Season

Activity (examples provided for guidance)	Disturbance Level	Training Required	General Mitigation
1 vehicle/equipment round trip (two passes) per 0.5 hour; Foot traffic, surveying; Spacer damper installation; Medium helicopter work at top of tower; Stringing (helicopter, pulling conductor); Inspection activities	Low	General Avian Awareness Training*	Operators and workers remain vigilant for any possible bird nesting activity, provide 5 m berth
2-5 vehicle/equipment round trip (two passes) per 0.5 hour; Any sustained activity for >1-4 hours over a 12 hour period within 100m of work site; Plumbing and tensioning guys; Tower hooking; Anchor pull testing; Clipping in conductor	Moderate	General Avian Awareness Training* and Consult a Manitoba Hydro Environmental Officer	General Mitigation Approach for Reducing Risk to Nesting Birds as per Appendix E-3 Nest sweep protocol as per Appendix E-4
>5 vehicle/equipment round trip (two passes) per 0.5 hour; Any sustained activity for >4 hours within 100m of work site; Vegetation clearing; Foundation installation; Stringing (implode sites, tensioner/puller sites); Tower assembly or installation; Road/trail construction	High		

*General Avian Awareness Training

General avian awareness training is to be provided by the Contractor to all crews and contractors conducting field work during the sensitive time period for birds identified in Timing Windows appendix. General avian awareness training involves basic introduction to bird biology, nesting characteristics, government regulations, and instruction on how to contact Manitoba Hydro Environmental officers, when specific questions arise.

Appendix E-3: General Mitigation Approach for Reducing Risk to Nesting Birds



Appendix E-4: Nest Sweep Protocol

Birds may nest on the ground, others nest in shrubs and/or trees, while other nest along the edges of water bodies. Nest sweeps are too be conducted on lands having potential to support bird nesting. Qualified[1] biologists employed / retained by the contractor are to complete nest sweeps no more than 7 days before disturbance activities. To complete a nest sweep the qualified biologist must:

1. Nest sweeps are to be done on foot and can be completed from sunrise until 1800 hours, however birds are most active from sunrise until 1000 hours. Nest sweeps will be discontinued during high winds or precipitation as birds are less active.
2. In advance of any medium or heavy disturbance activity (Appendix E-2) walk the entire area, ensuring full coverage. Recommended spacing between parallel transects is approximately 10 m, but surveyors may reduce this spacing as necessary.
3. Walk slowly, observing from ground-level, to the tops of the trees.
4. If a nest is suspected to be nearby based on bird behavior (e.g. acting strange/aggressive or agitated vocalizations), try to locate the nest location.
5. If the nest is found, mark the location with flagging tape (tie the flagging tape to a tree or other landmark several meters away). Record the following information on the flagging tape: location of the nest including UTM coordinates, type of bird (songbird, waterfowl) and the date.
6. If the bird species and the corresponding necessary buffer size cannot be readily determined, establish a temporary minimum 30 meter "no disturbance" buffer around the nest site.
7. Once the bird species has been determined, an appropriately sized "no disturbance" buffer must be setup around the nest location. Consult Appendix E-6 and select the most appropriate buffer or contact a Manitoba Hydro Environmental Officer.
8. Use flagging tape or appropriate signage to mark the required buffer around the nest location.
9. Enter each nest observation into the nesting bird collection form (Appendix E-5- MH will provide digital version in Excel format for submission) and include what actions were taken or what actions are recommended*.
10. Continue nest sweep until the entire area scheduled for construction activity has been adequately searched.
11. Submit to MH an Excel spreadsheet that is continuously updated throughout the sensitive timing window with structures and/or areas that have had nest sweeps conducted and the expiration date for those sweeps.
12. If a nest was found, there are two options:
    a. Defer disturbance within the required buffer as outlined in Appendix E-6. Activity can recommence after breeding bird nesting season, as described in Appendix E-1; or

[1] Qualified Biolgist is someone who has at least one field season of demonstrated experience in nest sweeps or avian surveys with references, and a post-secondary degree/diploma in wildlife biology, resume to be supplied to Manitoba Hydro for review and approval 15 days prior to construction activities occurring within Sensitive time period for birds.

b. Check the nest again seven (7) days from the day it was found to see if eggs have hatched and birds have left. If there is no sign of activity, complete another nest sweep of the buffer area. If no nests are found, proceed with activity. If after (7) days, the nest is still occupied, continue checking at seven (7) day intervals.

Nest Sweep Extension

As per Appendix E-3 nest sweeps may be extended from the original expiry date for an additional day if a medium or high level disturbance is initiated on the expiry date or extended continuously if medium or high level disturbances are sustained un-interrupted.

Scenarios for nest sweep extension or expiration

Day 01	**Day 02**	**Day 03**	**Day 04**	**Day 05**	**Day 06**	**Day 07**	**Day 08**	**Day 09 – August 31**
Original Sweep –clear of nesting activity						Medium or high level disturbance initiated at site	Sweep expiry date extended based on initiation of Medium or high level disturbance at site the previous day	Expiry Date continuously extended based on sustained Medium or high level disturbance at site the previous day

Day 01	**Day 02**	**Day 03**	**Day 04**	**Day 05**	**Day 06**	**Day 07**	**Day 08**
Original Sweep – Clear of nesting activity		Medium or high level disturbance initiated at site	Medium or high level disturbance sustained at site	Medium or high level disturbance sustained at site	No Medium or high level disturbance at site	Original Sweep Expiry No Medium or high level disturbance at site	Second sweep required due to un-sustained medium or high level activities

Appendix E-5:

Bird Nesting Collection Form (start sheet(s) for each new Location)

Name(s):	**Date:**

Location and general description of ROW area to be surveyed (i.e. S1 between towers 1234-1280 near Holland, MB):

Habitat (photo # and description):	**Temperature:**	**Wind**	**Noise**	**Precipitation**	**Cloud Cover**	**Weather (description):**
		Calm Light Air Light Breeze Gentle Breeze	None Low Moderate High	None Haze/Fog Drizzle Rain	0 - 25% 25 - 50% 50 - 75% 75 - 100%	

GPS Tracks should be recorded by each member on the survey and submitted with the daily reports.

Observation	**Time**	**UTM Zone**	**Easting**	**Northing**	**Species**	**Status of Nest/Parents**	**Mitigation Applied**	**GPS Photo**	**Comments**
(Nest/Territory)	(HH:MM:SS)	(14/15)	635401	5568325	(if not able to identify provide written description of nest site and surroundings)	Status (under const/# eggs /# hatchlings) Parents (/incubating/feeding)	(flagging an appropriate buffer, alerting appropriate Environmental Supervisor)	(Photo #)	Any Comments regarding the site

Key

Manitoba Conservation Data Centre specified
100-200 m Buffer
50 m Buffer
25 m Buffer

Species	Scientific Name	SARA (schedule & status)	COSEWIC (status & date assessed)	Habitat	Minimum Suggested Buffer (Meters)	Incubation Time (days)	Estimated Time to Leaving Nest or Fledging after hatching (Days)	Jurisdiction for Birds (F=Federal migratory, P=Provincial year-round resident), Nests = Provincial legislation for Herons, Eagles and others
Alder Flycatcher	*Empidonax alnorum*				25	12-14	12-15	F
American Bittern	*Botaurus lentiginosus*			Emergent-dominated wetlands	25	24-28	1-4	F
American Coot	*Fulica americana*			Emergent-dominated wetlands	25	21-25	1-4	F
American Crow	*Corvus brachyrhynchos*				25	15-18	28-35	None
American Dipper	*Cinclus mexicanus*				25	13-18	12-14	F
American Goldfinch	*Spinus tristis*				25	10-12	12-14	F
Green-winged Teal	*Anas c. carolinensis*				25	20-24	1-4	F
American Kestrel	*Falco sparverius*			Forest clearings, grassland, or pasture	25	29-30	30	F
American Pipit	*Anthus rubescens*				25	13-15	12-14	F
American Redstart	*Setophaga ruticilla*				25	12-14	12-14	F
American Robin	*Turdus migratorius*				25	12-14	12-14	F
American Three-toed Woodpecker	*Picoides dorsalis*				25	12-14	18-23	P
American Tree Sparrow	Spizella arborea				25	12-14	12-14	F
American white pelican	Pelecanus erythrorhynchos			isolated islands	1000	30		F
Arctic Warbler	Phylloscopus borealis				25	12-14	12-14	F
Bald Eagle	*Haliaeetus leucocephalus*			forests near water	1000	28-35	35-49	P
Baltimore Oriole	*Icterus galbula*			Forest, deciduous	25	12-14	12-14	F
Band-tailed pigeon	*Patagioenas fasciata*	Special Concern -1	Special Concern	Riparian Forest;Pasture/Old Field;Cultivated Field;Deciduous/Broadleaf Forest;Conifer Forest	25			
Bank Swallow	*Riparia riparia*		Threatened (Apr 2013)	Rivers	300	14-16	17-18	F
Baird's Sparrow	*Ammodramus bairdii*	Special Concern -1	Special Concern	Native grass prairie	500	11-12	8-11	F
Barn Swallow	*Hirundo rustica*		Threatened (May 2011)	Forest clearings, grassland, or pasture	150	13-17	17-18	F
Barred Owl	*Strix varia*			mature forest	1000	28-33	28-35	P
Barrow's Goldeneye	*Bucephala islandica*			Open water wetlands or riparian	25	28-44	1-4	F

Key

	Manitoba Conservation Data Centre specified
	100-200 m Buffer
	50 m Buffer
	25 m Buffer

Species	Scientific Name	SARA (schedule & status)	COSEWIC (status & date assessed)	Habitat	Minimum Suggested Buffer (Meters)	Incubation Time (days)	Estimated Time to Leaving Nest or Fledging after hatching (Days)	Jurisdiction for Birds (F=Federal migratory, P=Provincial year-round resident), Nests = Provincial legislation for Herons, Eagles and others
Bay-breasted Warbler	*Setophaga castanea*			Forest, coniferous	50	12-14	12-14	F
Belted Kingfisher	*Megaceryle alcyon*			Open water wetlands or riparian	25	22-24	27-29	F
Black Swift	*Cypseloides niger*			Riparian areas and forest; streams	25	24-27	12-14	F
Black Tern	*Chlidonias niger*			Open water wetlands or riparian	25	17-22	12-14	F
Black-and-white Warbler	*Mniotilta varia*				50	10-12	12-14	F
Black-backed Woodpecker	*Picoides arcticus*				25	12-14	21	P
Black-billed Magpie	*Pica hudsonia*				25	16-21	12-14	P
Black-capped Chickadee	*Poecile atricapillus*				25	11-13	12-14	P
Blackpoll Warbler	*Setophaga striata*					11-13	12-14	F
Black-throated Green Warbler	*Setophaga virens*			Forest, mixed wood; riparian	50	11-13	12-14	F
Blue Jay	*Cyanocitta cristata*				25	16-18	17-21	P
Blue-headed Vireo	*Vireo solitarius*				25	12-14	12-14	F
Blue-winged Teal	*Anas discors*			Open water wetlands or riparian	25	22-27	1-4	F
Bobolink	*Dolichonyx oryzivorus*		Threatened	forage crops	400	12	11-12	F
Bohemian Waxwing	*Bombycilla garrulus*				25	13-15	17-21	P
Boreal Chickadee	*Poecile hudsonicus*				25	14-18	12-14	P
Boreal Owl	*Aegolius funereus*			Forest, coniferous	1000	28-30	28-35	P
Brewers Blackbird	*Euphagus cyanocephalus*				5	11-17	12-16	None
Brewer's Sparrow	Spizella breweri				25	12-14	12-16	F
Broad-winged Hawk	*Buteo platypterus*			Forest, deciduous	200	28-31	28-35	F
Brown Creeper	*Certhia americana*			Forest, coniferous	25	14-18	12-16	P
Brown-headed Cowbird	*Molothrus ater*				25	10-13	12-16	F
Buff-brested Sandpiper	*Calidris subruficollis*	Special Concern-1	Special Concern (2012)	Stop-over sites, short grass	200	23-25	18-20	F
Bufflehead	*Bucephala albeola*				25	28-33	12-14	F
Burrowing owl	*Athene cunicularia*	Endangered-1	Endangered	pasture	500	28	21	F
Calliope Hummingbird	*Stellula calliope*				25	15-16	12-14	F
Canada Goose	*Branta canadensis*				25	25-30	1-2	F
Canada Warbler	*Cardellina canadensis*	1-Threatened (Feb 2010)	Threatened (Mar 2008)	Forest, mixed wood	450	11-13	12-14	F

Key

	Manitoba Conservation Data Centre specified
	100-200 m Buffer
	50 m Buffer
	25 m Buffer

Species	Scientific Name	SARA (schedule & status)	COSEWIC (status & date assessed)	Habitat	Minimum Suggested Buffer (Meters)	Incubation Time (days)	Estimated Time to Leaving Nest or Fledging after hatching (Days)	Jurisdiction for Birds (F=Federal migratory, P=Provincial year-round resident), Nests = Provincial legislation for Herons, Eagles and others
Canvasback	*Aythya valisineria*			Open water wetlands or riparian	25	23-29	1-4	F
Cape May Warbler	*Setophaga tigrina*			Forest, coniferous	50	11-13	12-14	F
Cassin's Finch	*Carpodacus cassinii*				25	12-14	12-14	F
Cedar Waxwing	*Bombycilla cedrorum*				25	12-16	12-14	F
Chestnut-collared longspur	*Calcarius ornatus*	1-Threatened	Threatened	mixed grass prairie	650	11		F
Chestnut-sided Warbler	*Setophaga pensylvanica*				25	11-14	12-14	F
Chimney swift	*Chaetura pelagica*	1-Threatened	Threatened	anthropogenic	300			F
Chipping Sparrow	*Spizella passerina*				25	11-14	12-14	F
Clay-colored Sparrow	*Spizella pallida*				25	10-12	12-14	F
Cliff Swallow	*Petrochelidon pyrrhonota*			Open water wetlands or riparian	25	14-16	12-14	F
Common Goldeneye	*Bucephala clangula*			Open water wetlands or riparian	25	28-33	1-2	F
Common Grackle	*Quiscalus quiscula*				5	12-14	12-14	None
Common Loon	*Gavia immer*				50	26-31	1-2	F
Common Merganser	*Mergus merganser*				25	28-35	1-2	F
Common Nighthawk	*Chordeiles minor*	1-Threatened (Feb 2010)	Threatened (Apr 2007)	Forest clearings, grassland, or pasture	300	19-20	17-18	F
Common Raven	*Corvus corax*				25	18-21	12-14	P
Common Redpoll	*Acanthis flammea*				25	10-11	9-14	P
Common Yellowthroat	*Geothlypis trichas*				25	11-14	12-14	F
Connecticut Warbler	*Oporornis agilis*			Forest, deciduous	50	11-14	12-14	F
Dark-eyed Junco	*Junco hyemalis*				25	11-14	12-14	P
Double-crested cormorant	*Phalocrocorax auritus*			aquatic	750			F
Downey Woodpecker	*Picoides pubescens*				25	11-14	12-14	P
Dusky Flycatcher	*Empidonax oberholseri*			Forest, coniferous	25	12-16	12-14	F
Dusky Grouse	*Dendragapus obscurus*			Shrubland or young forest	25	25-26	1-4	P
Eastern Kingbird	*Tyrannus tyrannus*			Open water wetlands or riparian	25	16-18	12-14	F
Eastern screech owl	*Megascops asio*			tree cover	500	26-30		P
Eastern whip-poor-will	*Antrostomus vociferus*	1-Threatened	Threatened	open woodland	300	19-21		F
Eastern wood-pewee	*Contopus virens*		Special Concern	clearings, forest edges	300	12-13		F
European Starling	*Sturnus vulgaris*				0	N/A	N/A	P
Evening Grosbeak	*Coccothraustes vespertinus*			Forest, mixed wood	25	12-16	12-14	P
Ferruginous hawk	*Buteo regalis*	1-Threatened	Threatened	open country	1000	32-33		P
Flammulated owl	*Psiloscops flammeolus*	1- Special Concern	Special Concern		50			
Fox Sparrow	*Passerella iliaca*				25	12-14	12-14	P

Key

	Manitoba Conservation Data Centre specified
	100-200 m Buffer
	50 m Buffer
	25 m Buffer

Species	Scientific Name	SARA (schedule & status)	COSEWIC (status & date assessed)	Habitat	Minimum Suggested Buffer (Meters)	Incubation Time (days)	Estimated Time to Leaving Nest or Fledging after hatching (Days)	Jurisdiction for Birds (F=Federal migratory, P=Provincial year-round resident), Nests = Provincial legislation for Herons, Eagles and others
Golden Eagle	*Aquila chrysaetos*			Cliffs	1000	41-45	45-81	F
Golden-crowned Kinglet	*Regulus satrapa*				25	14-15	12-14	P
Golden-crowned Sparrow	*Zonotrichia atricapilla*				25	11-14	12-14	F
Golden-winged warbler	*Vermivora chrysoptera*	1-Threatened	Threatened	open woodland	450	10-11		F
Grasshopper sparrow	*Ammodramus savannarum*			open grassland, prairie	400	11-13		F
Gray Jay	*Perisoreus canadensis*				25	16-18	22-24	P
Great Blue Heron	*Ardea herodias*			Forest, mixed wood	750	25-30	49-81	F- No removal without permit
Great Gray Owl	*Strix nebulosa*			Forest, mixed wood	1000	28-30	28-35	P
Great Horned Owl	*Bubo virginianus*			Forest, mixed wood	100	28-35	28-35	P
Greater Scaup	*Aythya marila*			Open water wetlands or riparian	25	24-28	1-4	F
Greater Yellowlegs	*Tringa melanoleuca*			Open water wetlands or riparian	25	20-24	1-4	F
Grebes				Colonial nesting sites	200			F
Green-winged Teal	*Anas crecca*				25	20-24	1-4	F
Gulls/Terns				Colonial nesting sites	500			F
Hairy Woodpecker	*Picoides villosus*				25	11-15	28-30	P
Hammond's Flycatcher	*Empidonax hammondii*				25	12-16	12-14	F
Harlequin Duck	*Histrionicus histrionicus*			Open water wetlands or riparian	100	27-30	1-2	F
Hermit Thrush	*Catharus guttatus*				25	12-14	12-14	F
Herons spp.				Nesting Colony	500			F
Hoary Redpoll	*Acanthis hornemanni*				25	9-12	12-14	P
Hooded Merganser	*Lophodytes cucullatus*				25	32-33	1-4	F
Horned Grebe	*Podiceps auritus*		Special Concern (Apr 2009)	Open water wetlands or riparian	400	22-25	1-4	F
Horned Lark	*Eremophila alpestris*			Alpine, subalpine	25	11-12	12-14	F
House Finch	*Carpodacus mexicanus*				25	12-14	12-14	F
House Sparrow	*Passer domesticus*				5	N/A	N/A	N/A
House Wren	*Troglodytes aedon*				25	12-16	12-14	F
Killdeer	*Charadrius vociferus*			Forest clearings, grassland, or pasture	25	22-28	1-2	F
Le Conte's Sparrow	*Ammodramus leconteii*			Emergent-dominated wetlands	25	12-14	12-14	F
Least Flycatcher	*Empidonax minimus*				25	12-17	12-14	F
Least Bittern	*Ixobrychus exilis*	Threatened-1	Threatened		200			F
Lesser Scaup	*Aythya affinis*			Open water wetlands or riparian	25	21-28	1-2	F
Lesser Yellowlegs	*Tringa flavipes*				25	22-23	1-2	F
Lincoln's Sparrow	*Melospiza lincolnii*				25	12-14	12-14	F
Loggerhead shrike prairie subspecies	*Lanius ludovicianus*	1-Threatened	Threatened	open woodland	500	16		F
Long-eared Owl	*Asio otus*				200	26-28	28-35	P
MacGillivray's Warbler	*Geothlypis tolmiei*				25	11-12	12-14	F
Magnolia Warbler	*Setophaga magnolia*				25	11-14	12-14	F
Mallard	*Anas platyrhynchos*				25	26-30	1-2	F
Marsh Wren	*Cistothorus palustris*				25	12-16	12-14	F

Key	
	Manitoba Conservation Data Centre specified
	100-200 m Buffer
	50 m Buffer
	25 m Buffer

Species	Scientific Name	SARA (schedule & status)	COSEWIC (status & date assessed)	Habitat	Minimum Suggested Buffer (Meters)	Incubation Time (days)	Estimated Time to Leaving Nest or Fledging after hatching (Days)	Jurisdiction for Birds (F=Federal migratory, P=Provincial year-round resident), Nests = Provincial legislation for Herons, Eagles and others
Merlin	*Falco columbarius*				25	28-32	29	F
Mountain Bluebird	*Sialia currucoides*				25	12-14	12-14	F
Mountain Chickadee	*Poecile gambeli*				25	11-12	12-14	P
Mountain White-crowned Sparrow	*Zonotrichia l. oriantha*				25	11-14	12-14	F
Mourning Warbler	*Geothlypis philadelphia*			Forest, mixed wood	25	12-14	12-14	F
Nashville Warbler	*Oreothlypis ruficapilla*				25	11-12	12-14	F
Nelson's Sparrow	*Ammodramus nelsoni*			Open water wetlands or riparian	50	11-12	12-14	F
Northern Flicker	*Colaptes auratus*				25	11-16	24-27	F
Northern Goshawk	*Accipiter gentilis*				200	36-41	12-14	P
Northern Harrier	*Circus cyaneus*			Forest clearings, grassland, or pasture	100	28-36	12-14	F
Northern Hawk Owl	*Surnia ulula*			coniferous or mix forest near open areas	1000	25-30	25-30	P
Northern Pintail	*Anas acuta*			Open water wetlands or riparian	25	22-25	1-2	F
Northern Pygmy-owl	*Glaucidium gnoma*			Forest, coniferous; forest, mixedwood	200	29-30	28-35	P
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*			Open water wetlands or riparian	25	11-14	18-21	F
Northern Saw-whet Owl	*Aegolius acadicus*				100	26-28	28-35	P
Northern Shoveler	*Anas clypeata*				25	21-27	1-2	F
Northern Shrike	*Lanius excubitor*				25	15-16	20-21	F
Northern Waterthrush	*Parkesia noveboracensis*				25	11-14	12-14	F
Olive-sided Flycatcher	*Contopus cooperi*	1-Threatened (Feb 2010)	Threatened (Nov 2007)	Forest, coniferous	300	14-17	12-14	F
Osprey	*Pandion haliaetus*				200	35-40	36-42	P
Ovenbird	*Seiurus aurocapilla*				25	11-14	12-14	F
Pacific Wren	*Troglodytes pacificus*					12-16	12-14	F
Pacific-slope Flycatcher	*Empidonax difficilis*			Forest, coniferous	25	14-16	12-14	F
Peregrine Falcon	*Falco peregrinus*	1-Threatened (May 2003)	Special Concern (Apr 2007)		1000	28-32	35-42	P
Philadelphia Vireo	*Vireo philadelphicus*			Shrubland or young forest	25	11-14	12-14	F
Pied-billed Grebe	*Podilymbus podiceps*			Open water wetlands or riparian	25	23-27	1-2	F
Pileated Woodpecker	*Dryocopus pileatus*			Forest, deciduous	25	15-18	24-28	F - No removal without permit
Pine Grosbeak	*Pinicola enucleator*			Forest, deciduous	25	10-12	12-14	P
Pine Siskin	*Spinus pinus*			Forest, coniferous	25	11-14	12-14	P
Piping plover	*Charadrius melodus melodus*	E-1	Endangered		400	25-27	Jan-00	F
Purple Finch	*Carpodacus purpureus*			Forest, coniferous	25	11-14	12-14	F

Key

	Manitoba Conservation Data Centre specified
	100-200 m Buffer
	50 m Buffer
	25 m Buffer

Species	Scientific Name	SARA (schedule & status)	COSEWIC (status & date assessed)	Habitat	Minimum Suggested Buffer (Meters)	Incubation Time (days)	Estimated Time to Leaving Nest or Fledging after hatching (Days)	Jurisdiction for Birds (F=Federal migratory, P=Provincial year-round resident), Nests = Provincial legislation for Herons, Eagles and others
Red Crossbill	*Loxia curvirostra*			Forest, coniferous	25	12-18	12-14	P
Red-breasted Merganser	*Mergus serrator*			Open water wetlands or riparian	25	29-35	1-2	F
Red-breasted Nuthatch	*Sitta canadensis*			Forest, coniferous	25	11-14	12-14	P
Red-breasted Sapsucker	*Sphyrapicus ruber*			Forest, deciduous	25	12-14	24-27	F
Red-eyed Vireo	*Vireo olivaceus*			Forest, deciduous	25	11-14	12-14	F
Redhead	*Aythya americana*			Open water wetlands or riparian	25	23-29	1-2	F
Red-headed woodpecker	*Melanerpes erythrocephalus*	1-Threatened	Threatened	open woodland	200	12-14		F
Red Knot	*Calidris canutus rufa*	E-1	Endangered	Stop-over sites	200	20-22	1-Feb	F
Red-naped Sapsucker	*Sphyrapicus nuchalis*			Forest, deciduous	25	12-14	24-27	F
Red-necked Grebe	*Podiceps grisegena*			Open water wetlands or riparian	25	20-23	1-2	F
Red-necked Phalarope	*Phalaropus lobatus*		Special Concern	Open water wetlands or riparian	25	17-21	1-2	F
Red-tailed Hawk	*Buteo jamaicensis*				100	30-35	42-46	F
Red-winged Blackbird	*Agelaius phoeniceus*			Open water wetlands or riparian	5	11-14	12-14	P
Ring-necked Duck	*Aythya collaris*			Open water wetlands or riparian	25	23-29	1-2	F
Rose-breasted Grosbeak	*Pheucticus ludovicianus*			Forest, deciduous	25	12-14	12-14	F
Ross's Gull	*Rhodostethia rosea*	Threatened-1	Threatened		1000	19-22	19-22	F
Rough-legged Hawk	*Buteo lagopus*			Alpine, subalpine, grassland, pasture	200	30-35	42-46	F
Ruby-crowned Kinglet	*Regulus calendula*				25	12-14	12-14	F
Ruby-throated Hummingbird	*Archilochus colubris*				25	11-16	12-14	F
Ruffed Grouse	*Bonasa umbellus*			Forest, mixed wood	25	21-28	1-4	P
Rufous Hummingbird	*Selasphorus rufus*			Forest, coniferous; Riparian areas and forest	25	12-14	12-14	F
Rusty Blackbird	*Euphagus carolinus*	1-Special Concern (Mar 2009)	Special Concern (Apr 2006)	Open water wetlands or riparian	300	12-18	12-14	F
Sandhill Crane	*Grus canadensis*				100	28-32	1-4	F
Savannah Sparrow	*Passerculus sandwichensis*				25	11-14	12-14	F
Say's Phoebe	*Sayornis saya*				25	12-14	12-14	F
Sharp-shinned Hawk					100	34-35	21-28	F
Sharp-tailed Grouse	*Tympanuchus phasianellus*			Forest clearings, grassland, or pasture (25m for a nest and 1000m for a lek)	25	21-28	1-4	P
Short-eared Owl	*Asio flammeus*	1-Special Concern (Jul 2012)	Special Concern (Mar 2008)	Alpine, subalpine, grassland, pasture	500	25-29	28-35	F
Snow Bunting	*Plectrophenax nivalis*				25	10-16	12-14	P
Snowy Owl	*Bubo scandiacus*			Forest clearings, grassland, or pasture	N/A	N/A	N/A	F

Key

	Manitoba Conservation Data Centre specified
	100-200 m Buffer
	50 m Buffer
	25 m Buffer

Species	Scientific Name	SARA (schedule & status)	COSEWIC (status & date assessed)	Habitat	Minimum Suggested Buffer (Meters)	Incubation Time (days)	Estimated Time to Leaving Nest or Fledging after hatching (Days)	Jurisdiction for Birds (F=Federal migratory, P=Provincial year-round resident), Nests = Provincial legislation for Herons, Eagles and others
Solitary Sandpiper	*Tringa solitaria*				25	23-24	17-20	F
Song Sparrow	*Melospiza melodia*				25	12-14	12-14	F
Sora	*Porzana carolina*				25	18-20	1-4	F
Spotted Sandpiper	*Actitis macularius*				25	20-24	1-4	F
Sprague's Pipit	*Anthus spragueii*	1-Threatened	Threatened	open grassland	650	12-14	12-14	F
Spruce Grouse	*Falcipennis canadensis*				25	21-24	1-4	P
Steller's Jay	*Cyanocitta stelleri*				25	16-18	16	P
Surf Scoter	*Melanitta perspicillata*			Open water wetlands or riparian	25	25-30	1-4	F
Swainson's Hawk	*Buteo swainsoni*				200	28-32	21-28	F
Swainson's Thrush	*Catharus ustulatus*			Forest, mixed wood	25	12-14	12-14	F
Swamp Sparrow	*Melospiza georgiana*				25	12-15	12-14	F
Tennessee Warbler	*Oreothlypis peregrina*				25	11-14	12-14	F
Townsend's Solitaire	*Myadestes townsendi*			Alpine, subalpine	25	12-14	12-14	F
Townsend's Warbler	*Setophaga townsendi*				25	12-14	12-14	F
Tree Swallow	*Tachycineta bicolor*			Open water wetlands or riparian	25	12-16	12-14	F
Trumpeter Swan	*Cygnus buccinator*				1000	32-37	1-4	F
Tundra Swan	*Cygnus columbianus*			Open water wetlands or riparian	100	31-40	1-4	F
Turkey Vulture	*Cathartes aura*				100	38-41	60-84	F
Upland Sandpiper	*Bartramia longicauda*			Forest clearings, grassland, or pasture	50	21-27	30-31	F
Varied Thrush	*Ixoreus naevius*				25	12-14	12-14	F
Vaux's Swift	*Chaetura vauxi*			Forest, coniferous; Forest, deciduous	25	18-20	12-14	F
Vesper Sparrow	*Pooecetes gramineus*			Forest clearings, grassland, or pasture	25	11-14	12-14	F
Violet-green Swallow	*Tachycineta thalassina*			Meadows; open woodlands; wooded canyons	25	12-14	12-14	F
Warbling Vireo	*Vireo gilvus*				25	12-14	12-14	F
Western Bluebird	*Sialia mexicana*				25	12-14	12-14	F
Western Grebe	*Aechmophorus occidentalis*			Open water wetlands or riparian	50	23-24	1-4	F
Western Kingbird	*Tyrannus verticalis*				25	18-20	12-14	F
Western Meadowlark	*Sturnella neglecta*				25	12-16	12-14	F
Western Palm Warbler	*Setophaga palmarum*				25	12-14	12-14	F
Western Tanager	*Piranga ludoviciana*				25	12-14	12-14	F
Western Wood-Pewee	*Contopus sordidulus*			Forest, coniferous;	25	12-14	12-14	F
White-breasted Nuthatch	*Sitta carolinensis*				25	12-14	12-14	P
White-crowned Sparrow	*Zonotrichia leucophrys*				25	11-14	12-14	F
White-throated Sparrow	*Zonotrichia albicollis*				25	11-14	12-14	F
White-winged Crossbill	*Loxia leucoptera*				25	12-14	12-14	P
Whooping Crane	*Grus americana*	Endangered-1	Endangered	Staging Area	750			F
Willow Ptarmigan	*Lagopus lagopus*				25	21-22	1-4	P

Key

	Manitoba Conservation Data Centre specified
	100-200 m Buffer
	50 m Buffer
	25 m Buffer

Species	Scientific Name	SARA (schedule & status)	COSEWIC (status & date assessed)	Habitat	Minimum Suggested Buffer (Meters)	Incubation Time (days)	Estimated Time to Leaving Nest or Fledging after hatching (Days)	Jurisdiction for Birds (F=Federal migratory, P=Provincial year-round resident), Nests = Provincial legislation for Herons, Eagles and others
Wilson's Phalarope	*Phalaropus tricolor*			Open water wetlands or riparian	25	18-21	1-4	F
Wilson's Snipe	*Gallinago delicata*			Emergent-dominated wetlands; riparian areas and forest	25	18-21	1-4	F
Wilson's Warbler	*Cardellina pusilla*			Shrubland or young forest	25	11-14	12-14	F
Winter Wren	*Troglodytes hiemalis*				25	12-16	12-14	F
Yellow Rail	*Coturnicops noveboracensis*	1-Special Concern (Jun 2003)	Special Concern (Nov 2009)	Emergent-dominated wetlands	350	16-18	1-4	F
Yellow Warbler	*Setophaga petechia*			Forest, deciduous; young/disturbed; riparian; willow	25	11-14	12-14	F
Yellow-bellied Flycatcher	*Empidonax flaviventris*				25	12-16	12-14	F
Yellow-bellied Sapsucker	*Sphyrapicus varius*				25	11-14	25-29	F
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*			Open water wetlands or riparian	25	11-14	12-14	F
Any other federal or provincially bird species not listed					25			

Appendix F: Reptile and Amphibian protection document

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Appendix F: Reptile and Amphibian protection document

Habitat identification

Amphibians should be assumed to be present in all wetland or shallow water areas supporting emergent vegetation (cattails, bulrushes, lily pads) during the amphibian emergence and breeding period (April 1st to August 15th).

When sampling the habitat, a qualified biologist, contractor, or consultant should investigate the shallow water zone (to rubber - boot depth), the waterline and the shore zone (within 3 meters of the waterline) when possible. In this way, other age classes of leopard frogs may be observed, such as egg masses and larvae (depending on the time of year). Both flowing and standing water can be surveyed in this fashion.

Visual encounter survey

Visual Encounter Surveys, to be completed by the contractor, are an effective method of locating frogs and egg masses during the breeding season (See excerpt from Kendell, 2002 below for survey procedure). Egg masses are easily detected when walking the shorelines and other shallow sections of a pond. Also, adult frogs are fairly active in the breeding season and are often found near egg masses, so that many can be located during visual searches. As a general rule, surveys conducted at various times of day are the single most effective method for removing frogs of all life stages during the active seasons.

Survey protocol should follow the steps outlined in Kendell (2002), which outlines:

- The habitat should be walked at a constant speed that is conducive to observing frogs under the given habitat characteristics at the site. For example, open habitats with sparse and low vegetation can be walked at a greater speed because the observer is less likely to overlook frogs obscured by vegetation. In contrast, a slower walking speed is required if the habitat possess - thicker and taller vegetation. In either case, the observer should walk in a systematic fashion to cover all favorable habitats both thoroughly and equally.
- A good self-test, to ensure that the proper speed and diligence is being used while surveying a habitat, is as follows: The individual conducting the survey should be able to spot less obvious animal life underfoot and within peripheral vision. For example, the individual may observe or hear a mouse scurrying through the grass, a young garter snake basking on a rock, other amphibian species and large insects on the ground, vegetation, water or below the surface of the water.
- Report survey results to Manitoba Hydro environment officer.

Kendell, K. 2002. Survey protocol for the northern leopard frog. Alberta Sustainable Resources Development, Fish and Wildlife Division, Alberta Species at Risk Report No. 43. Edmonton, Alberta. 30 pp.

Mitigation measures

- Restrict access to shallow water areas to protect breeding ponds and their vegetation from trampling and other disturbances. In areas directly impacted by construction, and in which amphibians occur, all life stages of frogs should be captured and removed to areas outside of the construction area.
- Erect exclusion fencing (e.g., sedimentation fence) prior to activities occurring in areas of breeding habitat (e.g., wetland features, low-lying ephemeral ponds) to minimize the risk of frogs entering the work area: Exclusion fencing height should be a minimum of 50 cm and the bottom of the fabric must be buried 10-20 cm down with an additional fabric lip extending outwards 90 degrees another 15 cm, the fabric lip must be backfilled and compacted to ensure it does not become exposed. Bury support stakes for exclusion fencing a minimum of 30 cm into the ground on the activity side of the fence; leave an overhang or lip on the exterior to prevent frogs from jumping into the fenced off area.

Appendix G: Species of Concern contingency measures

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Appendix G: Species of Concern contingency measures

The following procedures provide contingency measures for the discovery of species of concern prior to and during a construction project. Species of concern can include rare vascular plants, rare non-vascular plants, and rare wildlife species.

Plant Species of Concern Discovery Prior to Construction

In the event that rare plants are discovered during future vegetation studies along the transmission line, the plant or plant community will be assessed by a Manitoba Hydro vegetation specialist and appropriate mitigation measures will be determined prior to construction within the area of plant discovery. Mitigation measures will be determined following an assessment, which will include the following:

- the position of the plant or plant community on the construction right-of-way;
- the relative rarity of the plant or plant community (regionally, nationally, etc.);
- the local abundance of the plant or plant community.

Mitigation options to be implemented by the Contractor or Manitoba Hydro may include, however, are not limited to the following:

- narrowing down the proposed area of disturbance and protecting the site using fencing or clearly marking the site using flagging and signage (Contractor)
- informing project staff of access restrictions within in the vicinity of flagged or fenced sites (Contractor);
- temporarily covering the site with geotextile pads, flex net, mats or equivalent (Contractor);
- adjusting centerline access trail to avoid or limit potential effects on the plant or plant community (Contractor);
- adjusting tower location to avoid the plant or plant community (Manitoba Hydro);
- salvaging and transplanting portions of sod and surrounding vegetation Transplanted materials may be moved to a suitable location off right-of-way (Manitoba Hydro);
- other site-specific procedures to avoid disturbance to rare plants or plant communities, as recommended by the vegetation specialist (Contractor/Manitoba Hydro).

The Manitoba Hydro Senior Environmental Assessment Officer will be responsible for making the final decision on mitigation measures to be applied, in consultation with Environmental Officer/Inspector, a qualified biologist, Project Engineer and when uncertainty exists, the appropriate Provincial or Federal regulatory authorities. All mitigation measures for sites within the Project development area will be described in the Construction Environmental Protection Plan.

Wildlife Species of Concern Discovery Prior to Construction

In the event that wildlife species of concern or their site-specific habitat are discovered within the project area, the discovery will be assessed and appropriate mitigation measures will be determined by Manitoba Hydro. The wildlife or habitat will be assessed based on the following criteria:

- the location of the wildlife or habitat feature with respect to the project development area;
- the presence of topographic features or vegetation to effectively screen the wildlife or habitat from construction activities;
- the existing level of disturbance and ongoing sensory disturbance at the site;
- the timing of construction versus the critical timing constraints for the species; and
- the potential for an alteration of construction activities to reduce or avoid sensory and/or physical disturbance; and.
- the wildlife species, its conservation status and specific habitat needs relative to the area of development.

The mitigation measures to be implemented by the Contractor or Manitoba Hydro may include, but are not limited to, the following:

- abide by reduced risk timing windows within the recommended setback/buffer distances (Contractor);
- narrow down the proposed area of disturbance and protect the site using fencing or clearly mark the site using flagging (Contractor);
- alter or delay construction activities to avoid sensory disturbance (e.g., no burning) Contractor);
- inform project staff of access restrictions in the vicinity of flagged or fenced sites (Contractor);
- adjust tower locations to avoid the site (Manitoba Hydro);
- install nest boxes or platforms, or otherwise replace or enhance habitat during reclamation or restoration; and
- with the appropriate approval, relocate species (i.e., amphibians) or features (i.e., unoccupied stick nests)(Contractor), if practical.

The Manitoba Hydro senior environmental assessment officer will be responsible for making the final decision on mitigation measures to be applied, in consultation with environmental officer / inspector, a qualified biologist, Project Engineer and when uncertainty exists, the appropriate Provincial or Federal regulatory authorities. All sites and associated mitigation measures within the Project development area will be added to the Construction Environmental Protection Plan.

Species of concern discovery during project construction

In the event that rare plants or wildlife species are identified or suspected along the construction right-of-way during construction (e.g., during survey activities, prior to clearing and construction), contractor staff are to follow the measures outlined below:

- Suspend work immediately in the vicinity of any newly discovered species of concern. Work at that location may not resume until the measures below are conducted.
- Notify Manitoba Hydro environmental officer / inspector
- Flag or fence the area until the plant, wildlife species or community can be confirmed. MH environmental officer / inspector may enlist a qualified biologist to assist with confirmation

Implement protection measures based on specific site conditions and criteria found in reference ii - CEnvPP Appendix D (buffers and setbacks) and or Appendix E (avian protection)

The Manitoba Hydro senior environmental assessment officer will be responsible for making the final decision on mitigation measures to be applied, in consultation with environmental officer / inspector, a qualified biologist, Project Engineer and when uncertainty exists, the appropriate Provincial or Federal regulatory authorities. Mitigation measures generally fall into categories previously identified above.

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Appendix H: Biosecurity Management Plan

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Appendix I: Erosion and Sediment Control Plan

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Appendix J: Saturated/Thawed Soils Operating Guidelines

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St. Vital Transmission Project

Saturated/Thawed Soils Operating Guidelines

Manitoba Hydro

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Figures

1.0 Intent and Implementation

These operating guidelines define Contractor requirements with respect to saturated and/or thawed soils, including trigger conditions, assessment criteria, potential work modification options, thresholds for work shutdown, and plan submittal requirements.

These operating guideline are applicable to all Project Components including but not limited to the access roads/trails, right of way, marshalling yards (i.e. laydown yards, fly-yards) and temporary structures (i.e. stringing sites).

The process for utilization of these operating guidelines is:

1. The Contractor monitors site conditions against Trigger conditions
2. The Contractor assesses Criteria to determine if Work Modification is required
3. The Contractor determines the Work Modification (if applicable) that will be applied and submit their plan to Manitoba Hydro for Review.
    a. Plan submittal shall occur promptly.
    b. Unless the Work Modification chosen is stoppage of work, the work may proceed (with Work Modifications implemented) prior to Manitoba Hydro providing review comments to the Contractor.
    c. The Contractor shall notify Manitoba Hydro each time when/if the Contractor determines that any specific Work Modification is no longer required.
4. If the Threshold for a particular land cover type is exceeded:
    i. The Contractor shall reassess Criteria and submit a revised Work Modification plan to Manitoba Hydro for Review. Plan resubmittal shall occur promptly. Unless the Work Modification chosen is stoppage of work, the work may proceed (with Work Modifications implemented) prior to Manitoba Hydro providing review comments to the Contractor.
    ii. Manitoba Hydro may issue an Environmental Improvement Order or an Environmental Stop Work Order depending on the severity of the non-compliance, in accordance with the Contract.
5. A record of the location, timing, and reason for implementation of work stoppages, work resumptions, and Work Modifications will be maintained by the Contractor Environmental Representative and submitted to Manitoba Hydro in the Weekly Environmental Report.

2.0 Consideration of Guidelines when Planning Work

The Contractor shall plan, sequence, and schedule work activities in a manner that reduces environmental impact risks and the need for Work Modifications by reducing the activities occurring in saturated/thawed soil conditions. . The Contractor is responsible for developing any related protocols to facilitate the implementation of these guidelines.

Site-specific work modifications will be developed by the Contractor and proposed to Manitoba Hydro (MH) representatives for review.

3.0 Potential effects

The effects of wet weather during construction activities can have a significant impact on ground conditions and can change otherwise stable soils into soils that are affected by erosion and sedimentation. Freeze thaw cycles during the spring can also expose stable soils to an unstable condition overnight and throughout the day. Variations in soil conditions, construction activities, weather conditions, soil types and land cover are all contributing factors when considering working conditions and potential impacts to soil during saturated or thawed conditions. Potential effects to various types of land cover include:

- Compaction, which is considered the primary mechanism of effect to soil productivity and can affect re-vegetation success and crop performance.
- Rutting and admixing (mixing of topsoil and subsoils).
- Increased risk of water erosion and sedimentation in riparian areas affecting water quality and fish habitat.
- Access restrictions for traditional resource users, farmers, and the public due to road or trail rutting.

4.0 Weather parameters

Weather plays an integral role in the planning of work activities. Conditions such as spring thaw, shorter term warmer temperature periods, and heavy precipitation may require implementation of Work Modification, including localized work stoppage until ground conditions improve. The following weather events will trigger assessment for Work Modifications:

- Melting conditions indicated by rising air temperatures above -5^{O} Celsius
- During extended periods of adverse conditions (for rain is considered greater than 5 mm of rain in a 24 hour period)
- more than 50 mm of rain/5 cm of wet snow in the preceding 5 days; or
- the forecast calls for more than 50% certainty of 5 mm of rain/or 5 cm of wet snow in the next 24 hours

5.0 Rutting and Admixing identification

A rut is a depression made into the soil surface by the passage of a vehicle or equipment. Figure 1 illustrates how a rut is measured. Admixing – Examples of rutting can be found in Figure 2 which shows the beginning of soil admixing and Figure 3 shows advanced stages of admixing from continued travel.

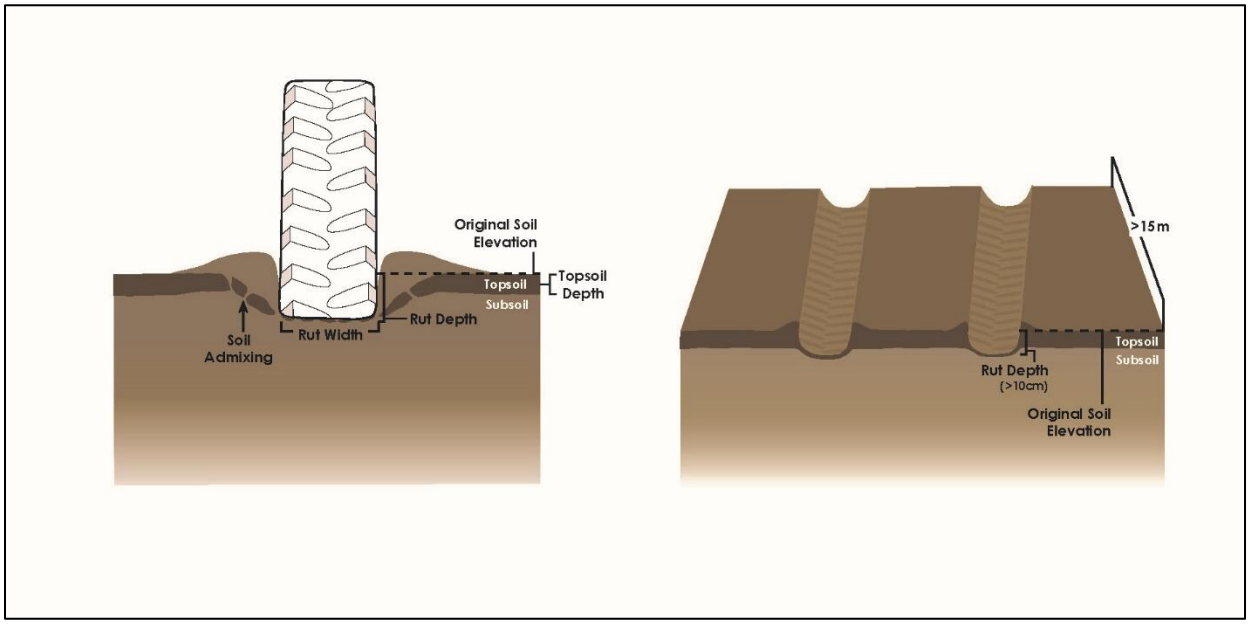

Figure 1: Rut Measurement Guide

Figure 2: Beginning of Admixing

Figure 3: Advanced Soil Admixing

6.0 Remediation

The level and type of disturbance at each individual site will dictate the amount of remediation necessary. Re-vegetation and/or erosion and sediment controls are site-specific conditions to be considered when planning remediation activities. Refer to the Erosion and Sediment Control Management Plan and the Rehabilitation and Invasive Species Management Plan for further guidance for each disturbed site.

7.0 Guidelines by land cover

7.1 Wetlands

Trigger(s) for the Assessment for Work Modification by Contractor

- When air temperature is projected to exceed -5°C that day or when ground conditions cannot support equipment without rutting and compaction; or
- MH Environmental Officer advises Contractor of requirement for potential work modification

Criteria to be assessed by the Contractor (Manitoba Hydro may conduct its own assessment)

- current and forecasted weather
- current ground conditions
- work schedule
- nature of work activities (i.e., pedestrian traffic vs heavy equipment)
- safety concerns

Potential Work Modifications (site-specific work modifications will be developed by the Contractor and proposed to Manitoba Hydro for review)

- placement of matting or snow
- low(er) ground pressure equipment
- reduced scope of work
- aerial work methods
- change of work hours
- change of work location
- stoppage of work
- Other modifications as approved by Manitoba Hydro

Thresholds for immediate implementation of Work Modification(s):

- When the depth of rutting exceeds 10 cm for more than 15 m in length;
- Admixing (mixing of topsoil and subsoils); or
- MH Environmental Officer advises Contractor of requirement for work modification.

If thresholds continue to be exceeded, either due to inadequate Work Modifications or lack of Work Modification, Manitoba Hydro may issue an Environmental Improvement Order or an Environmental Stop Work Order depending on the severity of the non-compliance, in accordance with the Contract.

7.2 Riparian areas and areas in proximity to water

Trigger(s) for the Assessment for Work Modification by Contractor

- Any excessive soil disturbance within riparian area including disturbance on the access trail crossing, ground conditions unable to support equipment without rutting and compaction; or
- MH Environmental Officer advises Contractor of requirement for work modification.

Criteria to be assessed by Contractor (Manitoba Hydro may conduct its own assessment)

- current and forecasted weather
- current ground and aquatic conditions
- work schedule
- nature of work activities (i.e., pedestrian traffic vs heavy equipment)
- accessibility to Project site(s)
- safety

Potential Work Modifications (site-specific work modifications will be developed by the Contractor and proposed to Manitoba Hydro for review)

- placement of matting or snow
- ice bridge
- low(er) ground pressure equipment
- reduced scope of work
- aerial work methods
- closure of access trail within riparian area
- change of work hours
- change of work location
- stoppage of work
- Other modifications as approved by Manitoba Hydro

Thresholds for immediate implementation of Work Modification(s):

- Any construction activity that affects surface water drainage directly into a water body (watercourse and/or wetland) without sufficient erosion and sediment control measure in place;
- Admixing (mixing of topsoil and subsoils); or
- MH Environmental Officer advises Contractor of requirement for work modification.

If thresholds continue to be exceeded, either due to inadequate Work Modifications or lack of Work Modification, Manitoba Hydro may issue an Environmental

Improvement Order or an Environmental Stop Work Order depending on the severity of the non-compliance, in accordance with the Contract.

7.3 Cultivated lands

Trigger(s) for the Assessment for Work Modification by Contractor

- When the depth of topsoil is rutted to 50% of the depth of topsoil for more than 15 m in length; or
- MH Environmental Officer advises Contractor of requirement for potential work modification

Criteria to be assessed by Contractor (Manitoba Hydro may conduct its own assessment)

- current and forecasted weather
- current ground conditions
- current crop and farming practices
- depth of topsoil
- salinity
- work schedule
- nature of work activities (i.e., pedestrian traffic vs heavy equipment)
- accessibility to Project site(s)
- safety

Potential Work Modifications (site-specific work modifications will be developed by the Contractor, and proposed to Manitoba Hydro for review with the landowner)

- placement of matting or snow
- lower ground pressure equipment
- reduced scope of work
- aerial work methods
- change of work hours
- change of work location
- stoppage of work
- Other modifications as approved by Manitoba Hydro

Thresholds for immediate implementation of Work Modification(s):

- When rutting depth of topsoil exceeds 80% of the topsoil depth for more than 15 m in length;
- Admixing (mixing of topsoil and subsoils); or
- MH Environmental Officer advises Contractor of requirement for immediate work modification.

If thresholds continue to be exceeded, either due to inadequate Work Modifications or lack of Work Modification, Manitoba Hydro may issue an Environmental Improvement Order or an Environmental Stop Work Order depending on the severity of the non-compliance, in accordance with the Contract.

7.4 Access routes and trails

Trigger(s) for the Assessment for Work Modification by Contractor

- When access route or trail conditions caused by the Project create additional risk of damage or barriers to movement to vehicles of other users; or
- MH Environmental Officer advises Contractor of requirement for potential work modification.

Criteria to be assessed by Contractor (Manitoba Hydro may conduct its own assessment)

- current and forecasted weather
- current ground conditions
- work schedule
- nature of work activities (i.e., pedestrian traffic vs heavy equipment)
- accessibility to Project site(s)
- safety

Potential Work Modifications (site-specific work modification(s) will be developed by the Contractor, and proposed to Manitoba Hydro for review with the landowner)

- placement of matting or snow
- lower ground pressure equipment
- closure of access route to Project traffic
- aerial work methods
- change of work hours
- change of work location
- stoppage of work
- Other modifications as approved by Manitoba Hydro

Thresholds for immediate implementation of Work Modification(s):

- Any evidence of access route/trail structure damage occurring, such as admixing, or the creation of ruts that impedes local vehicle traffic; or
- MH Environmental Officer advises Contractor of requirement for immediate implementation of work modification.

If thresholds continue to be exceeded, either due to inadequate Work Modifications or lack of Work Modification, Manitoba Hydro may issue an Environmental Improvement Order or an Environmental Stop Work Order depending on the severity of the non-compliance, in accordance with the Contract.

7.5 Forest, tame pasture and grasslands

Trigger(s) for the Assessment for Work Modification by Contractor

- When rutting depth exceeds 10 cm for more than 15 m in length; or
- MH Environmental Officer advises Contractor of requirement for immediate implementation of work modification(s).

Criteria to be assessed by Contractor (Manitoba Hydro may conduct its own assessment)

- current and forecasted weather
- current ground conditions
- work schedule
- nature of work activities (i.e. pedestrian traffic vs heavy equipment)
- accessibility to Project site(s)
- safety

Potential Work Modifications (site-specific work modifications will be developed by the Contractor, and proposed to Manitoba Hydro for review with the landowner)

- placement of matting or snow
- lower ground pressure equipment
- reduced scope of work
- aerial work methods
- change of work hours
- change of work location
- stoppage of work
- Other modifications as approved by Manitoba Hydro

Thresholds for immediate implementation of Work Modification(s):

- When rutting depth exceeds 30 cm for more than 15 m in length;
- Admixing (mixing of topsoil and subsoils); or
- MH Environmental Officer advises Contractor of requirement for immediate implementation of work modification.

If thresholds continue to be exceeded, either due to inadequate Work Modifications or lack of Work Modification, Manitoba Hydro may issue an Environmental Improvement Order or an Environmental Stop Work Order depending on the severity of the non-compliance, in accordance with the Contract.

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Appendix K: Rules for externally reportable releases and guidance for the identification of contaminated soils or groundwater and disposal

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Appendix K: Rules for externally reportable releases and guidance for the identification of contaminated soils or groundwater and disposal

Rules for externally reportable releases

To determine if a release should be reported to the regulator:

1) First determine if any of the rules apply. If so, an Emergency Report must be made by phone to Manitoba Conservation and Climate.
2) If no rules apply, check to see if the release meets or exceed the quantities on the 'Externally Reportable Quantities for Releases' table (see below). If so, report to Manitoba Conservation and Climate. Releases within engineered secondary containment or a designed mitigation system and are fully contained are not considered a release to the environment and therefore not reportable.

Externally Reportable Quantities for Releases

Hazard	TDG Class (If Applicable)	Reportable Quantity by Regulation	Reportable Quantity for Notification Purposes
Regulated			
Explosives (i.e. Dynamite)	1	Any Quantity	-
Compressed Gas			
Flammable (i.e. Aerosols, Propane)	2.1	100 L Container Capacity (refers to water capacity)	-
Flammable - Natural Gas[1] Underground Lines	-	-	Any quantity that causes death, injury, fire, explosion, evacuation, threatens safety of public, highly visible and notable, > 2" diameter lines and >550 kPa (80 psig), or has harmed the environment.
Non-Flammable, Non-Toxic (i.e. Anhydrous Ammonia, Fire Extinguishers)	2.2	100 L Container Capacity (refers to water capacity)	-
Toxic (i.e. Hydrogen Sulphide; Chlorine)	2.3	Any Quantity	-
Corrosive (i.e. Hydrogen Chloride)	2.3	Any Quantity	-
Flammable Liquids[2] (i.e. Gasoline, Acetone, Diesel Fuel, Methanol)	3	100 L	-
Flammable Solids, Spontaneous Combustible and Water-Reactive Substances (i.e. Sulphur, Zinc Dust)	4	1 kg	-
Oxidizing Substances			
Packing Groups I & II (i.e. Sodium Peroxide, Potassium Permanganate)	5.1	1 kg or 1 L	-
Packing Groups III (i.e. Potassium Nitrate)	5.1	50 kg or 50 L	-
Organic Peroxides (i.e. Methyl Ethyl Ketone Peroxide)	5.2	1 kg or 1 L	-
Toxic Substances			
Packing Group I (i.e. Acrylonitrile, Hydrogen Sulfide)	6.1	1 kg or 1 L	-
Packing Group II & III (i.e. Pesticides, Wood Preservative)	6.1	5 kg or 5 L	-

Infectious Substances (i.e. Infectious Substances affecting humans)	6.2	Any Quantity	-
Radioactive Materials (i.e. Nuclear Densometers)	7	Any discharge or radiation exceeding 10 mSv/h at the package surface and 0.2 mSv/h at 1m from the package surface	-
Corrosive (i.e. Hydrofluoric Acid, Battery Fluid, Mercury)	8	5 kg or 5 L	-
Hazard	**TDG Class** (If Applicable)	**Reportable Quantity by Regulation**	**Reportable Quantity for Notification Purposes**
Miscellaneous Products, Substances or Organisms (i.e. Lithium Cells & Batteries, Asbestos)	9	50 kg	-
Polychlorinated Biphenyls			
PCB or PCB Contaminated Oil IN USE	9	1 gram	-
PCB Containing Equipment IN STORAGE	9	Any Quantity ≥2 ppm	-
Ozone Depleting Substances (i.e. R-11 Refrigerant) ***Report using MOPIA form, do not call emergency number**	-	10 kg	-
Non Regulated			
Petroleum Products			
Engine Oil	-	-	30 L
Insulating Oil	-	-	100 L
Lubricating & Hydraulic Oil	-	-	50 L
Pesticides (Non-TDG Regulated)			
Concentrate	-	-	10 L
Solutions, Mixtures	-	-	100 L
Antifreeze (Non-TDG Regulated) (Propylene & Ethylene Glycol)	-	-	50 L
Sewage (Solid Sludge or Liquid)	-	-	500 kg or 500 L

Guidance for the identification of contaminated soils or groundwater and disposal

Objective

This guidance document has been developed to provide general information and direction on recognized methods considered acceptable by the regulatory agencies when contamination or suspected environmental impacts have been encountered. The information within this document is intended to assist frontline workers when conducting preliminary environmental site assessments or investigations of sites or lands where the quality of groundwater, surface water, sediments and/or soil have potentially or is suspected of being impacted or affected by hazardous materials as result of past or present usage of the site or land.

The guidance document has been developed as an informational reference tool only and is intended for frontline supervisors, inspection personnel, contractors and/or subcontractor working under contract or on Manitoba Hydro owned property that do not have formal training in environmental site assessments or site investigations.

Identifying impacted surface water / groundwater or soils

Surface water, groundwater and soils have known observable characteristics when they come into contact with some hazardous materials. For example water (surface or ground) that has been impacted by petroleum hydrocarbons - PHC's (such as petroleum, fuels – such as diesel or gasoline, and/or lubricants) may have display an obvious hydrocarbon odour and/or multi coloured 'sheen' that is typically visible to the naked eye and appear on the surface of the liquid (like a film or residue) and are typical indications that water has been impacted by PHC's.

Similarly soils that have been impacted with PHC's typically turn "grey-black" in color or become "stained" depending on weathering and they also typically have a strong PHC odour and appears unnatural compared to other native soils is exposed for comparison.

Water or soils exhibiting these types of observable characteristics should be documented (daily reports, photos, GPS coordinates, etc.) and the MH environmental officer / inspector is to be notified as soon as practical. All work shall be halted in areas where suspected impacted/contamination exists until the MH environmental officer / inspector has been notified and no materials (soils, water, debris) suspected to be impacted by a hazardous material shall be permitted from the suspected area until the MH environmental officer / inspector has been notified and has granted approval to proceed.

Manitoba Hydro construction activities have the potential to impact work locations through equipment malfunction and or spills. Hazardous materials such as petroleum hydrocarbons (PHC), polycyclic aromatic hydrocarbons (PAHs), and glycols can result from incidents on a site. Any excavated soils from Manitoba Hydro owned or leased properties must either be sampled prior to disposal at a licensed facility or directly transported to a licensed facility. MH Property and Corporate Environment department or Transmission Line and Civil Construction Soils Remediation section can be contacted to assist in determining a suitable or Licenced disposal facility.

Photo 1: PHC (oil) staining on wood mulch/soil

Photo 2: PHC (oil) staining clay soil

Worker health and safety

Workers who suspect they have encountered materials impacted by a hazardous material will need to assess what protective measures are required to further assess the site or manage the suspected impacts. This may include wearing appropriate personal protective equipment (PPE) if they are required to handle or manage the impacted materials/contamination (i.e. soils and surface groundwater).

Appropriate PPE will be dependent on the hazardous material or contaminant and contaminant concentration (if known), and may include but not be limited to: nitrile or rubber gloves, half or full mask respirator, safety boots, protective clothing, and protective eyewear.

A qualified environmental professional or consultant will engaged to confirm, and subsequently characterize the hazardous materials and. assess the impact to the environment as required.

Communications / notifications

If impacted/contaminated materials are encountered during construction, all personnel working within the suspected area are to immediately stop work, leave the suspect impacted/contaminated area, secure the site and notify the on-site environmental officer or MH environmental officer / inspector.

Additional notifications of the potential hazards would then be made to all applicable personnel as required.

Impacted soil and water handling and disposal

In the event that impacts or contamination as a result of hazardous materials is encountered or is suspected during construction the following measures should be taken to further protect worker health and safety:

If possible limit personnel working within or around the impacted area until a further assessment is conducted.

Secure the site or area suspected to be impacted or contaminated and keep unauthorized personnel out of the area (barriers may be required) until further assessment is conducted.

Notify project supervisor and the MH environmental officer / inspector to assist/initiate further site assessment process

If impacted materials have been mobilized as part of the work or prior to identifying the impacts, then the material should be segregated and/or contained if at all possible, and all efforts to prevent further impacts or contamination shall be undertaken.

(Example – excavated soils suspected to be impacted shall be placed on an impermeable surface and covered to prevent precipitation run-off until the soils can be assessed for contaminants.)

Soil and/or groundwater samples if required will be sent to a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory for waste characterization. (note MH Selkirk Laboratory has this capacity)

Soils will be characterized for waste disposal and appropriate truck placarding. (as per the corporate policy and as per the MH *Hazardous Materials Management Handbook*)

Contaminated soils and/or groundwater will be transported in accordance with the Manitoba *Dangerous Goods Handling and Transportation Act* and associated Regulations. As per MH - *Hazardous Materials Management Handbook*

http://hrcs.hydro.mb.ca/wshcs/ws/we/Pages/HazardousMaterials.aspx

Decontamination of equipment, as required

Please note that prior to the disposal of soils confirmed to be impacted above the applicable regulatory criteria, current provincial legislation requires a 'remedial action plan' to be submitted to the provincial regulator for their approval. In addition at the conclusion of the remedial activities, a closure report is also required to be submitted. The Remedial Action Plan(s) and Closure Report(s) will be in accordance with the Manitoba *Contaminated Sites Remediation Act*, and its associated regulations and guidance documents.

Use guidelines and upon approval of the waste disposal ground. However, if soil samples are above these guidelines, soils must be disposed of at a licensed soil treatment facility. Options include the following facilities:

Contaminated Soil Disposal		
MidCanada Soil Treatment Facility	1373 Bernat Road, Grand Pointe, MB	(204) 987-9600
Miller Environmental Corporation	Hwy 14 & 75, Saint Jean Baptiste, MB	(204) 925-9600
City of Brandon Landfill	3300 Victoria Avenue East, Brandon, MB	(204) 729-2281
Virden Municipal & Industrial Waste Facility	236 Wellington Street South, Virden, MB	(204) 204-512-0816 or (204) 748-6033
Contaminated Water Disposal		
A1 Environmental Services	1447 Dugald Road, Winnipeg, MB	(204) 515-2473

All contaminated soils and water will be disposed of in accordance with the *Manitoba Dangerous Goods Handling and Transportation Act,* and the *Manitoba Contaminated Sites Remediation Act,* and associated regulations and guidelines.

The above mentioned legislation and associated regulations mandate that a qualified environmental professional is to conduct formal environmental site assessments or investigation and are required to follow an established guideline. As such if a site has been determined to be 'suspect' for contamination as a result of observations made using this guidance document then a qualified environmental professional is required when conducting a formal site assessment that includes a remedial action plan (RAP).

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Appendix L: Cultural and Heritage Resources Protection Plan

Appendix M: Access Management Plan

Appendix N: Example Environmental pre-work orientation record

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Transmission Line and Civil Construction
Contractor Environmental Pre-job Orientation

The following Transmission Line and Civil Construction Environmental Pre-Job Orientation will be reviewed with the Contractor at the contract start-up meeting by the Manitoba Hydro Project Engineer and/or Construction Supervisor as well the Senior Environmental Assessment Officer and/or Environmental Officer.

Upon completion of the orientation all individuals present at the orientation, both Manitoba Hydro and the Contractor representatives, will sign this document.

Division:
Department:
Project Name:
Contract Number:
Work Location:
Environment Act Licence Number:
MCWS Work Permit Number:
Meeting Date:
Contractor:

Contact List
Manitoba Hydro Project Engineer: **Manitoba Hydro Field Engineer:**
Manitoba Hydro Licence Compliance Officer: **Onsite Environmental Inspectors:**

Contractor:
Contractor Project Manager: _____Email: _____ Address: _____ Phone Numbers: Office (_____)_____Cell (_____)_____
Contractor Construction Manager: _____Email: _____ Address: _____ Phone Numbers: Office (_____)_____Cell (_____)_____
Contractor Environmental Supervisor: _____Email:_____ Address: _____ Phone Numbers: Office (_____)_____Cell (_____)_____
Contractor Environmental Representative: _____Email:_____ Address: _____ Phone Numbers: Office (_____)_____Cell (_____)_____

List Sub-Contractors:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Key Environmental Requirements Review:

Site Specific Concerns:

Site Specific Concerns:

Pre-Job Orientation Check List:

Check off all items that apply to the contracted work being done as they are discussed.

Topic	Reference Plans	Discussed
•	•	
•	•	
•	•	
•	•	
•	•	
•	•	
•	•	
•	•	
•	•	
•	•	

REMARKS:

Any specific environmental concerns that are not mentioned here will be discussed at weekly progress meetings and/or at pre-job (TAILBOARD) meetings prior to the work being performed.

The above items have been discussed and understood. Any questions relating to these items may be discussed further during the course of the contract.

_____ _____

MANITOBA HYDRO REPRESENTATIVE (SIGN) YYYY MM DD

_____ _____

CONTRACTOR'S REPRESENTATIVE (SIGN) YYYY MM DD

All individuals present at the Contractor Pre-Job Orientation must indicate that they have participated and understand all items discussed by signing the document below:

Name (print)	Company	Signature

Contractor Environmental Pre-Job Orientation Procedures

NOTE:
The instructions provided on this sheet are intended only for internal use by Manitoba Hydro employees.

1. The Contractor Environmental Pre- Job Orientation is to be held with Contractor Supervisory and Environmental Representatives prior to the start of any onsite activities associated with the contract.

2. All individuals present at the Contractor Environmental Pre- Job Orientation must sign the attendance sheet.

3. The Contractor Environmental Pre- Job Orientation should be read out loud in its entirety. Discussions on each topic and the opportunity to ask questions should be provided as required.

4. All required information regarding the Contractor Environmental Pre- Job Orientation must be completed (additional notes as required).

5. Obtain all names/signatures and other information required in the Contractor Environmental Pre- Job Orientation

6. Distribution of the Contractor Environmental Pre- Job Orientation:

   A copy of the signed original is to be kept in the contract environment folder as well as onsite with all other relevant documents, permits, etc.

   A copy of the signed original should be sent to:
   - Contractor Supervisory Representative(s)
   - Contractor Environmental Representative(s)
   - Manitoba Hydro Project Engineer and/or Construction Supervisor
   - Senior Environmental Assessment Officer and/or Environmental Officer(s)

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Appendix O: Rehabilitation and invasive species management plan

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Appendix P: Waste and Recycling Management Plan

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Appendix Q: Ice Thickness Chart

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Ice thickness chart

***Estimated Bearing Capacity of Blue Ice Chart**

Ice Thickness			Estimated Weight Bearing Capacity		Ice Thickness			Estimated Weight Bearing Capacity	Ice Conditions
1 in	2.5 cm	=	100	lbs	21 in	53.3 cm	=	44103 lbs	**Blue Ice** is clear in texture and has the
2 in	5.1 cm	=	400	lbs	22 in	55.9 cm	=	48403 lbs	maximum allowable bearing capacity of all ice
3 in	7.6 cm	=	900	lbs	23 in	58.4 cm	=	52904 lbs	
4 in	10.2 cm	=	1,600	lbs	24 in	61.0 cm	=	57604 lbs	**Flood Ice or White ice** is considered to have
5 in	12.7 cm	=	2,500	lbs	25 in	63.5 cm	=	62505 lbs	only 50% of the load bearing capacity of
6 in	15.2 cm	=	3,600	lbs	26 in	66.0 cm	=	67605 lbs	Natural Blue Ice & the maximum flood should
7 in	17.8 cm	=	4,900	lbs	27 in	68.6 cm	=	72905 lbs	not exceed 2"
8 in	20.3 cm	=	6,400	lbs	28 in	71.1 cm	=	78406 lbs	
9 in	22.9 cm	=	8,101	lbs	29 in	73.7 cm	=	84106 lbs	**Slush or white ice** is white in texture and is
10 in	25.4 cm	=	10,001	lbs	30 in	76.2 cm	=	90006 lbs	considered to have only 50% of the bearing
11 in	27.9 cm	=	12,101	lbs	31 in	78.7 cm	=	96107 lbs	capacity of natural Blue Ice
12 in	30.5 cm	=	14,401	lbs	32 in	81.3 cm	=	102407 lbs	
13 in	33.0 cm	=	16,901	lbs	33 in	83.8 cm	=	108908 lbs	**Grey Ice, Crystallized ice or Honeycomb**
14 in	35.6 cm	=	19,601	lbs	34 in	86.4 cm	=	115608 lbs	ice indicates the presence of water running
15 in	38.1 cm	=	22,502	lbs	35 in	88.9 cm	=	122509 lbs	thru the ice & should not be trusted as a load
16 in	40.6 cm	=	25,602	lbs	36 in	91.4 cm	=	129609 lbs	bearing surface
17 in	43.2 cm	=	28,902	lbs	37 in	94.0 cm	=	136910 lbs	
18 in	45.7 cm	=	32,402	lbs	38 in	96.5 cm	=	144410 lbs	**Imperial & Metric Conversions**
19 in	48.3 cm	=	36,103	lbs	39 in	99.1 cm	=	152111 lbs	**Inches x 2.54 = cm** **Lbs x .4535 = kg**
20 in	50.8 cm	=	40,003	lbs	40 in	101.6 cm	=	160011 lbs	**Cm x 0.3937 = In** **Kg x 2.205 = lbs**

*NOTE: Given the many variables involved in the development of ice crossings and roads, these values are intended to be used as an approximation and Manitoba Hydro assumes no responsibility for loss or damage of property

Available in accessible formats upon request