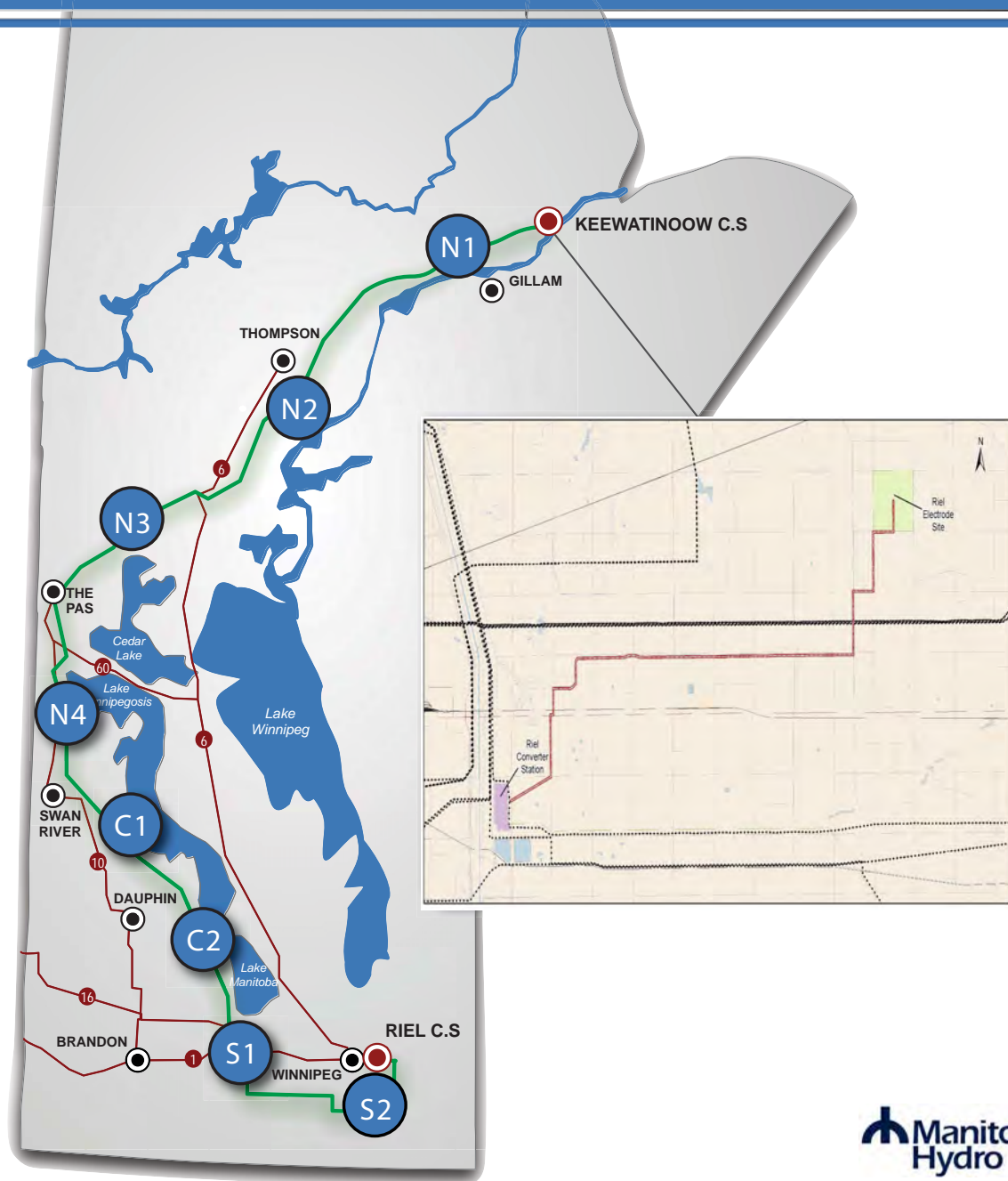


BIPOLE III TRANSMISSION PROJECT CONSTRUCTION ENVIRONMENTAL PROTECTION PLAN - Riel Converter Station Facilities, Infrastructure and Ground Electrode



Document Owner
Licensing and Environmental Assessment Department
Transmission Planning and Design Division
Transmission Business Unit
Manitoba Hydro

Version – Final

List of Revisions

Number	Nature of Revision	Section(s)	Revised By	Date

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 full 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 or surpassing regulatory, contractual and voluntary requirements;*
- considering the interests and utilizing the knowledge of our customers, employees, communities, and stakeholders who may be affected by our actions;*
- reviewing our environmental objectives and targets annually to ensure improvement in our environmental performance; and*
- documenting and reporting our activities and environmental performance."*

Manitoba Hydro'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 shall 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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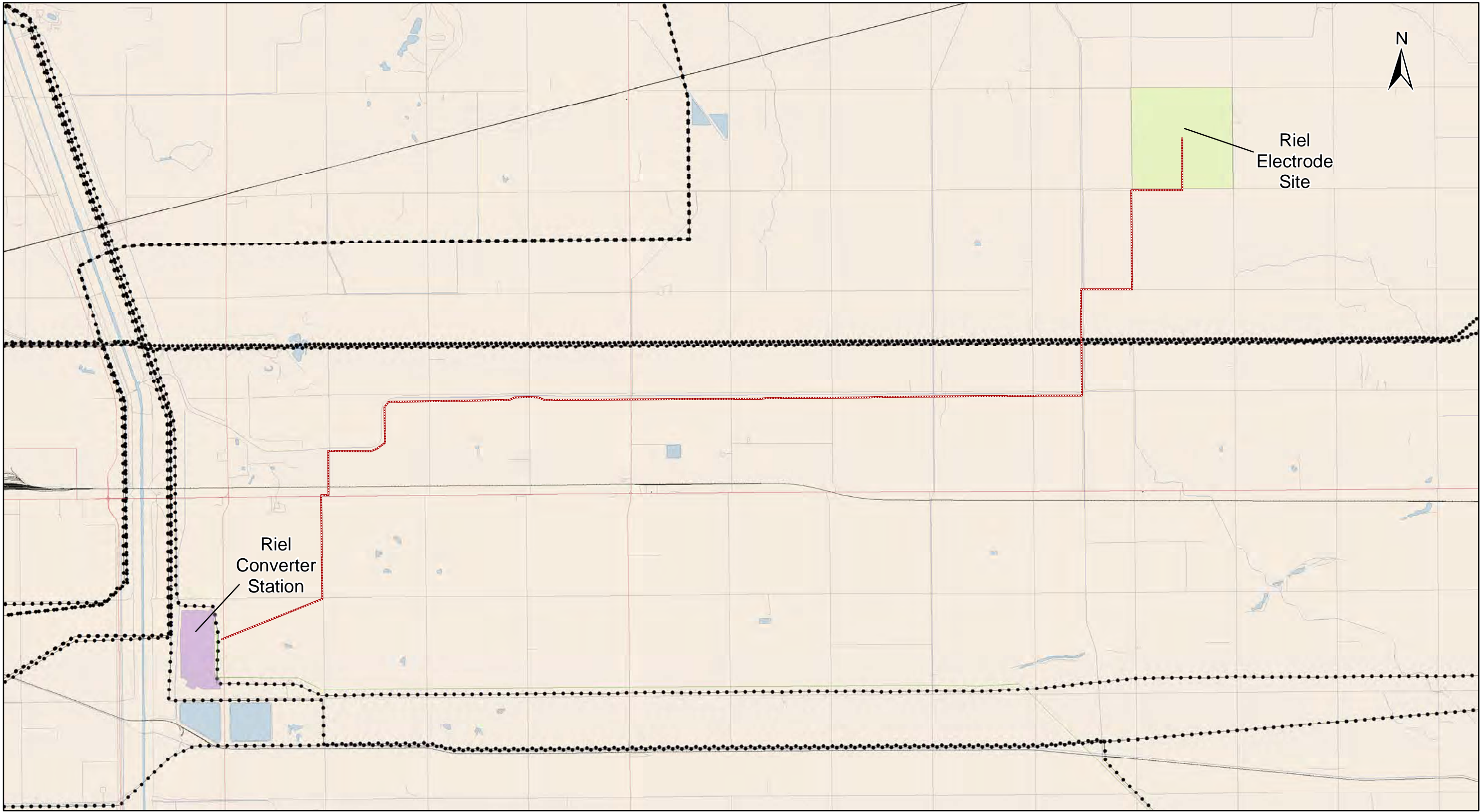
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1.0 INTRODUCTION

The Construction Environmental Protection Plan (CEnvPP) outlines the commitments and efforts that will be undertaken by Manitoba Hydro and contractors to protect the environment and mitigate potential environmental effects that may occur during construction of the Riel Converter Station Facilities and Infrastructure and associated Ground Electrode components of the Bipole III Transmission Project (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 Riel Converter Station facilities and infrastructure, herein referred to as the “Converter Station”, and the Ground Electrode Site, herein referred to as the “Electrode Site” (Map 1). These components will be collectively referred to as the “Project”.



Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: June 27, 2014
Version: Final

0 700 1,400 2,800
Metres
1:60,000

- | Land Base | Project Infrastructure |
|-----------------------|-------------------------------|
| ••• Transmission Line | — Ground Electrode Line |
| — Highway | ■ Ground Electrode Site |
| — Major Road | ■ Riel Converter Station Site |
| — Local Road | |

Bipole III Transmission Project
Construction Environmental Protection Plan
Riel Converter Station
and Ground Electrode Site Overview

1.1 OVERVIEW OF ENVIRONMENTAL PROTECTION PLAN

Part of Manitoba Hydro's commitment to environmental protection includes the development of a comprehensive Environmental Protection Program (EPP) for the Project. This program includes the development of a Project-Level Environmental Protection Plan (EnvPP) and Construction EnvPPs (CEnvPPs) specific to each major Project component (Figure 1-1). The Project-Level EnvPP contains general environmental protection information applicable to all project components, provides a foundation for developing component-specific CEnvPPs, and is intended for project managers and regulators. The CEnvPPs provide general and specific environmental protection information for each project component and are intended for use by construction contractors and environmental staff.

A number of **Environmentally Sensitive Sites** (ESS) have been identified for converter station and the electrode site. ESS are locations, features, areas, activities or facilities that were identified in the Bipole III Transmission Project EIS to be ecologically, socially, economically or culturally important or sensitive to disturbance and require protection during construction of the project. The determination of ESS has included the consideration of Aboriginal Traditional Knowledge (ATK). Manitoba Hydro will continue to engage with stakeholders and aboriginal communities in efforts to continually update this plan with sensitive sites and current knowledge as it is shared.

Map sheets have been developed at a scale of 1:10,000 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.



Figure 1-1: Relationship between Environmental Protection Documents

1.2 ROLES, RESPONSIBILITIES AND REPORTING

This section outlines the major roles and responsibilities of those involved in the implementation of the CEnvPP for the Project. A summary of roles and key responsibilities is found in Table 1-1. Communication and reporting on environmental issues, monitoring and compliance will be as outlined in Figure 1-2. A contact list for key staff involved in supporting this CEnvPP is found in Appendix A.

1.2.1 Environmental Protection

Manitoba Hydro will provide copies of all available permits, licences, approvals and authorizations obtained for the Project to the Contractor. Electronic copies of all permits are available for download from the Environmental Protection Information Management System.

The Contractor will comply with the Environmental Protection Plans prepared for the Project, including mitigation measures identified during the environmental assessment phase and contained herein. Environmental aspects of the work including applicable licence/permit conditions will be discussed during the Post-Contract Award Meeting, Pre-Construction Meeting, 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; and
- 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.

1.2.2 Contractor's On-Site Environmental Representative(s)

Before commencing the on-site work, the Contractor shall identify its dedicated on-site Environmental Officer(s)/Supervisor(s), who shall attend the Pre-Construction Meeting to review environmental matters for the work. The dedicated On-Site Environmental Representative shall be fully conversant with:

- Contractor's Environmental Practices and Policies;
- All applicable Environmental Legislation; and
- The conditions of Project and Construction Environmental Protection Plans.

1.2.3 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 are considered “effective immediately”. A compliance date will be established by Manitoba Hydro 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:

- within the expiry date of the period specified in the order or any extension thereof, prepare a written report on the measures taken to remedy the contravention and on any measures yet to be taken;
- send a copy of the report to the Manitoba Hydro Representative who made the order;
- if applicable, provide a copy of the report to the employee(s) involved; and
- if applicable, review the contravention with all employees at regular weekly meeting and post in a prominent place at or near the workplace.

1.2.4 Manitoba Hydro 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 in a workplace, 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 workplace 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; and
- 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.

Table 1-1: Environmental Roles and Responsibilities of Personnel During the Construction Phase

Role	Key Responsibilities
Project Manager (off-site)	<ul style="list-style-type: none"> Ensures all environmental plans, permits, authorizations, licences and approvals are in place for the project. Oversees Resident Engineer / Manager or delegate. Makes decisions at the corporate level. Review and sign off on spill response plan. Applies for the Project work permit with support from the Licensing and Environmental Assessment Department and consults with Licensing and Environmental Assessment Department if changes are required. Obtains any other required permits or approvals from Manitoba Conservation and Water Stewardship.
Resident Engineer / Manager (on-site)	<ul style="list-style-type: none"> Ensures that all project activities are conducted in accordance with the EnvPP and other Project related permits, authorizations, licences, approvals, regulations and guidelines. Oversees Site Environmental Officer and those named as Contract "Engineer" or representative and. Ensures that both Manitoba Hydro personnel and all contractors are aware of the contents of the EnvPP, and other environmental approvals and related legislation. Solicits feedback and supports the Site Environmental Officer or delegate. Monitors reports prepared by the Site Environmental Officer or delegate and assists with corrective measures if required. Supervises the Site Environmental Officer or delegate in environmental compliance monitoring to ensure that the terms of all regulatory approvals and the EnvPP are followed. Has the authority to issue stop work orders, change orders, etc. with contractor. Determines action or response to incidents or non-compliance situations. Confirms that erosion control measures are implemented as outlined in the erosion and sediment control section of the contract technical specifications and/or erosion and sediment control plan. Executes the Project work permit. Ensures that construction activities cease at a particular location if heritage resources (or human remains) are discovered and contacts the Project Archaeologist. Participates in a post-construction inspection of the Project area with the regional Natural Resources Officer (Manitoba Conservation and Water Stewardship) to confirm compliance with the Environment Act Licence and identifies any deficiencies to be addressed.
Contract "Engineer"	<ul style="list-style-type: none"> Administers the construction contracts. Executes the Resident Engineer / Manager's environmental responsibilities on their behalf. Has the authority to issue stop work orders, change orders, etc. with contractor. Determines action or response to incidents or non-compliance situations. Confirms that erosion control measures are implemented as outlined in the erosion and sediment control section of the contract technical specifications and/or erosion and sediment control plan.

Table 1-1: Environmental Roles and Responsibilities of Personnel During the Construction Phase

Role	Key Responsibilities
Site Environmental Officer(s)	<ul style="list-style-type: none"> • Conducts environmental compliance monitoring to ensure that the terms of the EnvPP and other project environmental approvals are followed. • Participates in orientation of environmental requirements to the contractor(s), their staff and Manitoba Hydro personnel. • Works with the contractor to ensure regulatory compliance and implementation of the EnvPP. • Conducts construction site inspections maintaining a record of all activities. • Documents any construction site issues or mitigation measures required to address unanticipated effects. • Has the authority to issue stop work orders with contractor. • Reports environmental incidents immediately to the Resident Engineer / Manager or delegate. • Liaises with local Manitoba Conservation and Water Stewardship personnel. • Ensures that construction activities cease at a particular location if heritage resources (or human remains) are discovered and contacts the Resident Engineer / Manager or delegate. • Facilitates post-construction inspection of the Project area with the regional Natural Resources Officer (Manitoba Conservation and Water Stewardship) to confirm compliance with the Environment Act Licence and identifies any deficiencies to be addressed.
Licensing and Environmental Assessment Department	<ul style="list-style-type: none"> • Provides advice and guidance on environmental protection matters. • Monitors inspection reports and monitoring information, and prepares annual report as per regulatory requirements. • Liaises with Manitoba Conservation and Water Stewardship, Environmental Approvals Branch.
New Generation Construction (NGC) Environmental Specialist	<ul style="list-style-type: none"> • Off-site support for all aspects of the EnvPP and environmental approvals. • Provides advice and guidance on environmental protection matters. • Liaises with Licensing and Environmental Assessment Department. • Liaises with Regional regulatory authorities. • Provides advice and guidance to Manitoba Hydro site staff for non-compliance situations, environmental incidents and emergencies. • Ensures all reporting into Environmental Protection Information Management System.
Manitoba Hydro Personnel	<ul style="list-style-type: none"> • Reports any heritage resources (or human remains) discoveries to their line management. • Follows all regulations and guidelines set out in the EnvPP and environmental approvals. • Reports any violations of regulations to their line management. • Exercises due diligence in carrying out project activities.

Table 1-1: Environmental Roles and Responsibilities of Personnel During the Construction Phase

Role	Key Responsibilities
Contractor(s)	<ul style="list-style-type: none"> Accountable for all regulatory and environmental approvals (i.e., follow CEnvPP and mitigation measures prescribed) Ensure all contractor project staff and agents 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 Contract "Engineer" and Site Environmental Officer. 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 Contract "Engineer" and Site Environmental Officer. Maintains detailed records of inventories, wastes, incidents, alterations, accidents, equipment maintenance and any public complaints. Responsible for providing an emergency response plan for their work areas. Responsible for reporting all spills as outlined in the spill response plan. Responsible for cleaning up spills and collection of soil samples while being monitored by Manitoba Hydro. Responsible for storage and collection of hazardous wastes. Responsible for following the spill response plan. Responsible for other permits as outlined in Appendix B
Contractor's Personnel	<ul style="list-style-type: none"> 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 Contractor. 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 Contractor.
Contractor's On-Site Environmental Representative	<ul style="list-style-type: none"> Ensures that the contractor's personnel adhere to all aspects of the Construction Environmental Protection Plan. Provides information and advice to the Contractor's personnel on environmental protection and safety matters. Responsible for implementation of the contractor environmental plans (Appendix D), Project and Construction EnvPPs, and contractors' environmental practices and policies. Liaise with Manitoba Hydro Site Environmental Officer on environmental issues.

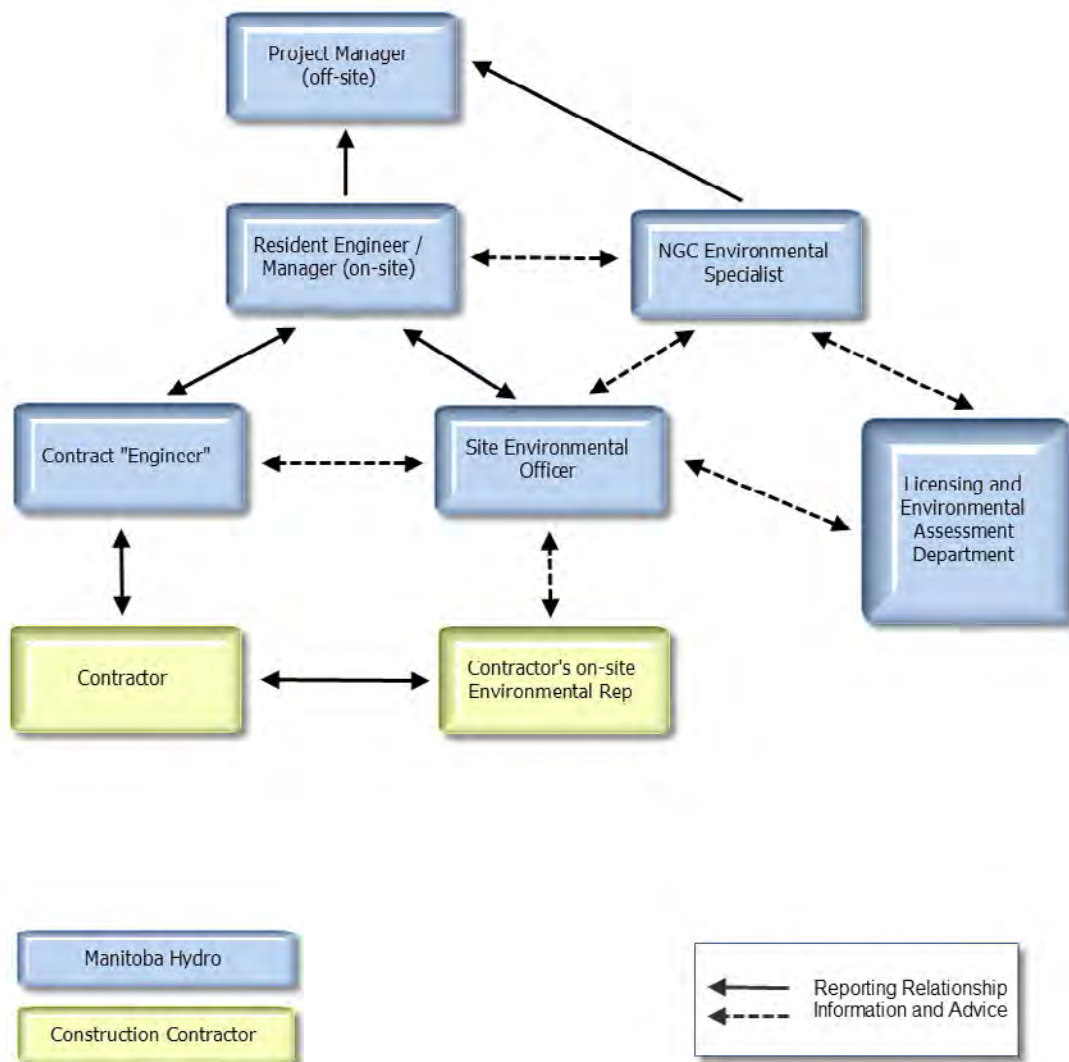


Figure 1-2: Environmental Communication Reporting Structure

1.3 ENVIRONMENTAL PROTECTION INFORMATION MANAGEMENT SYSTEM

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

1.4 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: Project Licences, Approvals and Permits and in EPIMS.

2.0 PROJECT DESCRIPTION

This Construction Environmental Protection Plan (CEnvPP) includes the following general components:

- Riel Converter Station Facilities and Infrastructure; and
- Riel Ground Electrode.

A detailed project description is available in the Bipole III Transmission Project Environmental Impact Statement.

2.1 RIEL CONVERTER STATION

As outlined in Section 3.3.4BP III Transmission Project Environmental Impact Statement, the southern terminus of the Bipole III HVdc transmissionline will be at a new converter station (Riel Converter Station), located on the Riel

Station site, in the RM of Springfield immediately east of the Winnipeg Floodway and north of the City of Winnipeg Deacon Water Supply Reservoir. The site is presently under development for the previously approved and licensed Riel Reliability Improvement Initiative (Riel Sectionalization).

The Riel Converter Station development required for the Bipole III complex will share the site infrastructure and certain other elements being developed for the Riel Reliability Improvement Initiative. The Bipole III development at Riel will include expansion of the 230 kV ac switchyard, as well as new infrastructure including synchronouscondensers, converter transformers, a converter building, solid state power electronic valve groups, and a dc switchyard. As at Keewatinoow Converter Station, a new Riel ground electrode will be developed at a separate site and will be connected to the station by a new, low voltage overhead line.

The Riel Converter Station site will be located at the existing Riel Station, situated immediately west of PR 207 land in the east half of Section 26, Township 10, Range 4 E.P.M. (see Figure 2-1). The existing Riel station site occupies a footprint of approximately 110 ha. The station fenced area is nominally 640 m x 1,278 m in dimension, occupying approximately 82 ha of land. The Bipole III facilities at Riel, excluding modifications to the 230 kV switchyard, will generally occupy the northeast portion of the site.

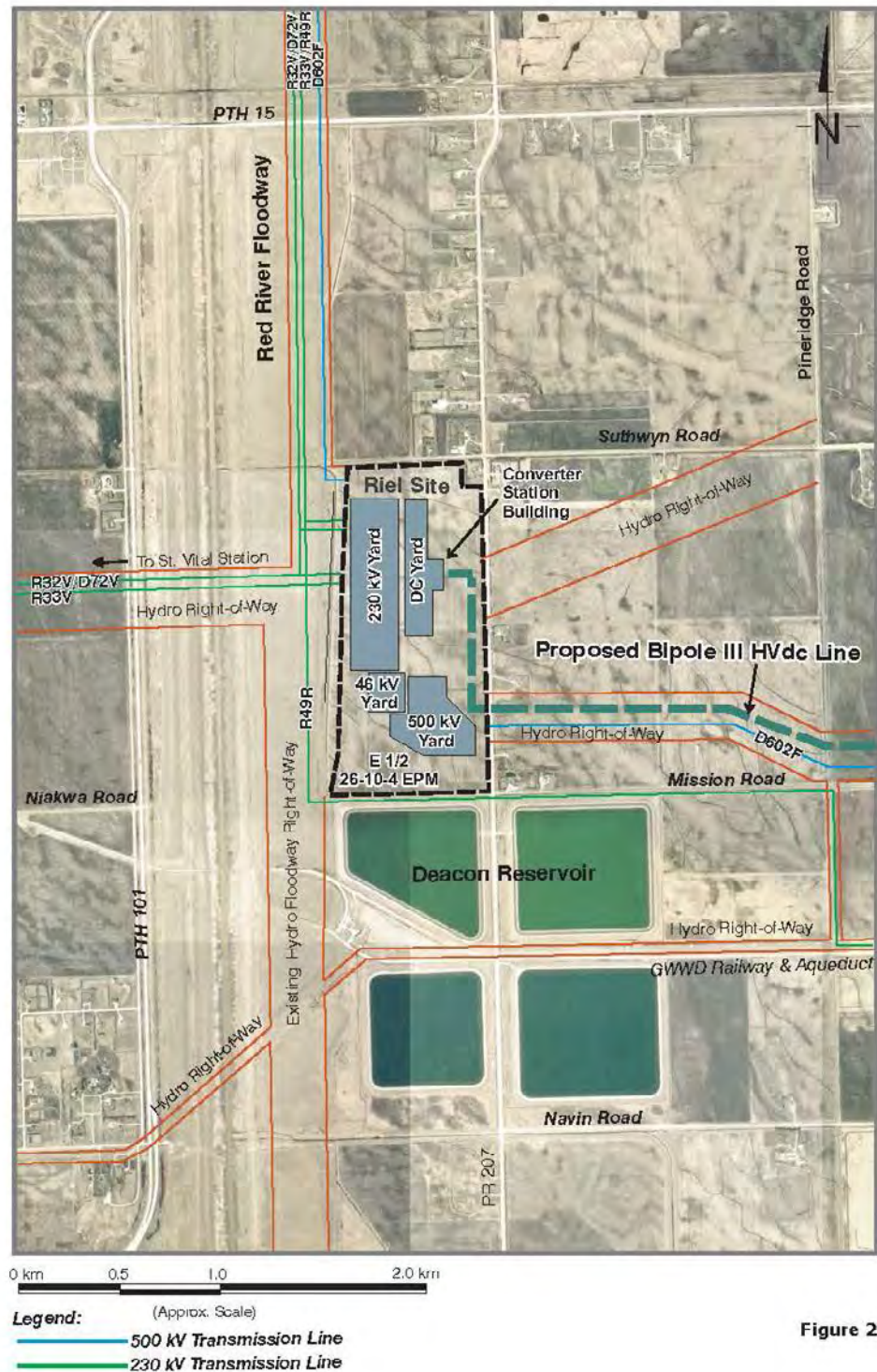


Figure 2-1

Figure 2-1: Riel Converter Station Development Concept

2.2 THE RIEL GROUND ELECTRODE SITE

The Riel ground electrode site is located in Section 21, Township 11, Range 6 E.P.M. The electrode site land requirement will include the entire section (i.e., approximately 1,600 m x 1,600 m or 2,560,000 m² [256 ha].), and includes a substantial buffer area surrounding the actual site required for installation of the electrode and ancillary facilities. The ground electrode will likely be a shallow ring electrode, estimated to be approximately 400 m in diameter, and situated centrally within the site. The surface of the central area of the site (an area of approximately 500 m x 500 m above the ground electrode itself) is expected to be maintained as a grassed area. See detailed maps in Section 7

3.0 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 Bipole III Transmission Project EIS to be ecologically, socially, economically or culturally important or sensitive to disturbance. This ESS requires protection and mitigation during construction of the Project. 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).

4.0 ENVIRONMENTAL PROTECTION PLAN ORIENTATION AND AWARENESS

4.1 POST-CONTRACT AWARD MEETING

A post-contract award meeting will be held between the Contractor and Manitoba Hydro (senior staff including Contract “Engineer” and Manitoba Hydro Environmental Representative (NGC Environmental Specialist or Site Environmental Officer)).

The environmental portion of this meeting will include the following:

- A review of Manitoba Hydro’s Environmental Principles and all environmental specifications of the Contract;
- Transfer of relevant information or precautions that Manitoba Hydro is aware of and which pertain to the job; and
- A review of required Contractor developed environmental plans.

The Contractor shall communicate to all Contractor’s Personnel the work specifications, environmental requirements and information provided during the post-contract award meeting and notify the Contract “Engineer” in writing when it has been completed.

Manitoba Hydro will be responsible for the maintenance of minutes/documents related to this meeting.

4.2 PRE-CONSTRUCTION MEETING

A pre-construction meeting will be held between the Contractor (Contractor, On-Site Environmental Representative) and Manitoba Hydro (Resident Engineer / Manager, Contract “Engineer” and Site Environmental Officer).

The environmental portion of this meeting will include the following:

- A review of environmental protection plan;
- Transfer of further relevant information or precautions that Manitoba Hydro is aware of and which pertain to the job;
- Procedures/requirements for dealing with environmental stop work orders or improvement orders;
- Reporting procedures for environmental incidents and emergencies (includes spill response);
- Documentation needs including the review of all pertinent forms (i.e. job planning form; environmental checklist); and

- Requirement to educate/train all Project employees with respect to the requirements of this Construction EnvPP.

Manitoba Hydro will be responsible for the maintenance of minutes/documents related to these meetings. The Contractor is required to ensure all other pertinent information is distributed to their personnel.

4.3 PROGRESS MEETINGS

Senior field staff will meet on a regularly scheduled 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.

4.4 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 be used to review environmental requirements of the job and environmental precautions necessary. All job planning meetings, including the environmental content, shall be documented by the Contractor.

5.0 CONTRACTOR DEVELOPED ENVIRONMENTAL PLANS

Construction contractors will be required to develop environmental plans as part of the environmental protection program for this project component. The following may be included:

1. Emergency Preparedness and Response Plan:
 - The contractor will prepare a Project specific Emergency Response Plan that is complimentary to the Manitoba Hydro Emergency Response Plan including prevention planning and response for both hazardous material spills and fires. The plan will be reviewed and accepted by the Resident Engineer /Manager or delegate.
 - The contractor is responsible for all spills in their work areas. All spills shall be reported to the Contract Engineer and Site Environmental Officer. Spills requiring regulatory reporting be submitted as per the Spill Response Plan. The contractor will appoint a Spill Response Coordinator for their work areas. Site clean-up and disposal of contaminated material will be managed by the contractor as stated in the Spill Response Plan in consultation with the Contract Engineer and Site Environmental Officer.
 - The contractor shall ensure that proper fire fighting practices are established and that adequate firefighting equipment is installed and maintained in all buildings, vehicles and work areas under their ownership. Emergency response/evacuation procedures will be adhered to in case of forest fires.
2. Waste and Recycling Management Plan:
 - The Contractor shall be responsible to develop and implement a Waste and Recycling Management Plan that follows the Waste and Recycling Management Framework for its work.
3. Erosion and Sediment Control Plan:
 - The Contractor shall be responsible to develop and implement site-specific Erosion and Sediment Control Plans for its work.
4. Concrete Washout Management Plan:
 - Contractors utilizing batching, placement machinery or concrete delivery equipment shall be responsible to develop and implement site-specific Concrete Washout Management Plan for its work.

6.0 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 6.6)** and **specific mitigation measures (see detailed maps and specific mitigation in Section 7)**.

6.1 BUFFERS AND SETBACKS

Buffers are work areas where restricted activities such as low disturbance clearing are permitted. **Setbacks** are areas to be maintained from a given environmental feature where *no work* shall occur.

In some instances, ESS will have detailed mitigation measures including site-specific setbacks and buffers (see Section 7). Prescribed setbacks and buffer distances from sensitive environmental features will be based upon sensitivity of the ESS.

These setbacks and buffers are preliminary and may be expanded or refined based on further data collection, regulatory license and work permits to be issued for the project.

Example of a Buffer:

A stream will have a riparian buffer based upon the quality of fish habitat. This buffer may limit the type of construction activity.

Example of a Setback:

Breeding areas or nests of select wildlife species will have setback distances that exclude construction activity for a specific time period.

6.2 TIMING WINDOWS

Table 6-1 outlines federally and provincially regulated timing windows when construction activity is likely to negatively impact wildlife (fish, birds, mammals). Timing windows may be expanded or refined based on further data collection, regulatory licences and work permits to be issued for the project.

The recommended windows are considerate of periods of the year when wildlife species are sensitive to disruptive operations because of a sensitive lifecycle activity such as spawning, calving, nesting, and hibernation, etc. Table 6-2 is intended to assist in scheduling certain construction activities outside of these sensitive periods when risks of adverse construction impacts are negligible. Where conflicting timing restraints with construction activities exist in a particular area, additional mitigation, determined in conjunction with regulators, will have to be considered and implemented to reduce effects.

Table 6-1: Timing Windows

Restriction	Restriction Timing Window	Details
Clearing	May 1- July 31	Clearing shall avoid the sensitive breeding period for birds.

Table 6-2: Burning Permit Requirements

Timeline	Permit Required	Other Required Action
April 1 – November 15	Yes	<ul style="list-style-type: none"> Acquire burn permit from Manitoba Conservation and Water Stewardship. Observe the RM's Fire Prevention Bylaw 09-02 A copy of the permit must be provided to the Site Environmental Officer or delegate. Written notification must be provided to the Site Environmental Officer or delegate regarding intent to burn and when burn is extinguished.
November 16 – March 31*	No	<ul style="list-style-type: none"> Written notification must be provided to the Site Environmental Officer or delegate regarding intent to burn and when burn is extinguished.
March 1 – March 31	No	<ul style="list-style-type: none"> Written notification to Manitoba Conservation and Water Stewardship district office.

*Note: Extinguish all fires by March 31; immediately inform Manitoba Conservation and Water Stewardship if not extinguished before March 31.

6.3 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 activity, these sites will be identified on the Map Sheets in Section 7.0.

Riparian Buffers (as shown in Table 6-3) are applied to riparian habitats 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 than 50% site investigation and prescription by MH Senior Environmental Assessment Officer is required. **Seven meter Machine free zones** are work areas where restricted activities such as low disturbance clearing are permitted by reaching into zone with equipment but not entering the zone except at trail crossing.

Table 6-3: Riparian Buffer Distances Based on Slope

Slope of Land Entering Waterway (%)	Width of Riparian Buffer (m)
10	30
20	40
30	55
40	70
50	85

Boundaries of **Riparian Buffers** and **Machine Free Zones** are measured from the **Ordinary High Water Mark (OHWM)** (Figure 6-1). Setbacks are measured from the Tree Line or from a defined riparian boundary as delineated by an Aquatics Specialist.

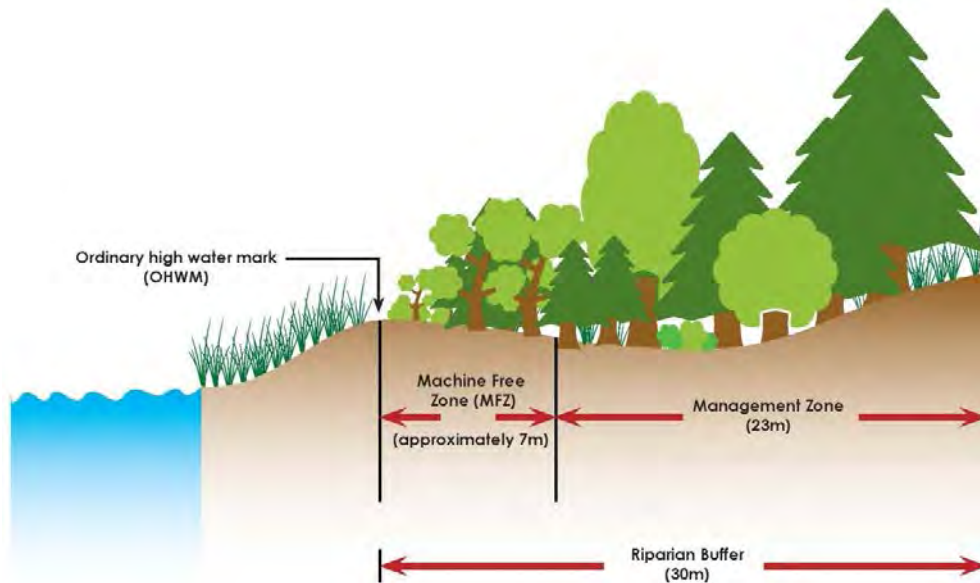


Figure 6-1: Example of Zones in a 30m Riparian Buffer

6.4 ESS – RIPARIAN MITIGATION

Activities associated with project construction pose a low risk to fish habitat. Because of this low level of risk, Operational Statements (OS) developed by the Fisheries and Oceans Canada will be applied to modify construction of overhead lines, temporary stream crossings, and dry open cut stream crossings (Appendix E). In addition to Fisheries and Oceans Canada OS requirements, Contractors will implement setbacks and buffers as indicated on Site-specific information the Map Sheets Section 7.0.

6.5 GENERAL MITIGATION REQUIREMENTS

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

The environmental protection 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 Bipole III Transmission 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 protection/sediment control, hazardous substances, petroleum products and soil contamination.

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.

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Access Roads and Trails (PC-1)

ID	Mitigation
PC-1.01	Access roads and trails no longer required shall be decommissioned and rehabilitated in accordance with the Rehabilitation and Vegetation Management Plan.
PC-1.03	Access roads and trails shall be constructed to a minimum length and width to accommodate the safe movement of construction equipment
PC-1.05	Access roads and trails shall be provided with erosion protection and sediment control measures in accordance with the Erosion Protection and Sediment Control Plan.
PC-1.06	Vehicle, machinery and pedestrian traffic shall be restricted to established access roads and trails, and cleared construction areas in accordance with the Access Management Plan.
PC-1.07	Approach grades to waterbodies shall be minimized to limit disturbance to riparian areas.
PC-1.08	Bypass trails, sensitive sites and buffer areas shall be clearly marked prior to clearing, to identify that prescribed selective clearing is to occur as per Map Sheets.
PC-1.11	Equipment, machinery and vehicles shall only travel on cleared access roads and trails, and shall cross waterways at established temporary and permanent crossings.
PC-1.12	Existing access roads, trails or cut lines shall be used to the extent possible.
PC-1.13	MCWS Work Permits shall be obtained prior to the commencement of the project.
PC-1.14	Clean abrasives may be used as alternatives to chemical melting agents.
PC-1.15	Only water and approved dust suppression products shall be used to control dust on access roads where required. Oil or petroleum products shall not be used.
PC-1.16	Public use of decommissioned access routes shall be controlled through the Access Management Plan .
PC-1.17	Public use of project controlled access roads and trails during construction shall be controlled through the Access Management Plans.
PC-1.18	Grades 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 shall be directed away from disturbed and erosion prone areas but not directly into waterbodies.
PC-1.20	Vegetation control along access roads and trails shall be in accordance with the Rehabilitation and Vegetation Management Plan.
PC-1.21	The Site Environmental Officer shall inspect access roads and trails prior to decommissioning to evaluate adherence to environmental protection measures and to document areas of potential contamination.
PC-1.22	The Site Environmental Officer shall inspect decommissioned and rehabilitated access roads and trails in accordance with the Rehabilitation and Vegetation Management Plan to assess the success of re-vegetation and to determine if additional rehabilitation is required.

Agricultural Areas (EC-1)

ID	Mitigation
EC-1.01	All fences and gates shall be left in "as-found" condition.
EC-1.02	Any necessary access on agricultural lands shall be discussed in advance with the landowner.
EC-1.03	Construction areas and sites shall be assessed for compaction and if required shall be deep ploughed by the contractor to mitigate any compaction prior to returning them to agricultural use.
EC-1.04	Erosion protection and sediment control measures shall be established before construction work commences in agricultural areas where necessary.
EC-1.05	Excess construction materials (i.e. waste, granular fill; clay) shall be removed from construction sites and areas located on agricultural lands. Area shall be restored to pre-existing conditions.
EC-1.06	Existing access to agricultural lands shall be utilized to the extent possible.
EC-1.07	Required travel off existing roads shall be minimized and restricted to previously designated and approved routes.
EC-1.08	Vehicular travel on agricultural lands shall follow existing roads, trails and paths to the extent possible.

Blasting (PA-1)

ID	Mitigation
PA-1.01	A communication protocol shall be developed to notify affected parties of blasting operations and conductor splicing. Affected parties may include Manitoba Conservation and Water Stewardship, RCMP, municipalities, landowners, and resource users.
PA-1.02	Blasting shall 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	Where practical, blasting shall be scheduled from Aug 1 to April 30th, to avoid the critical nesting periods. The practicality and feasibility of the works shall be at the determination of the Resident Engineer / Manager in consultation with the NGC Environmental Specialist
PA-1.05	Explosives shall 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-1.07	Quarry blasting operations and conductor splicing shall be scheduled to minimize disturbance to wildlife and area residents, and to ensure the safety of workers.
PA-1.08	The Blasting Contractor shall be in possession of valid licenses, permits and certificates required for blasting in Manitoba.
PA-1.09	The Blasting Contractor shall submit a Blasting Plan to the Contract "Engineer" for review and approval prior to commencement of blasting operations.
PA-1.10	Only DFO approved explosives shall be permitted in or near waterways.
PA-1.13	Drillhole sites shall be clearly marked with flagging tape and signs.
PA-1.14	Large explosive charges shall be divided into smaller multiple time-delay charges, where practical. The practicality and feasibility of the works shall be at the determination of the Resident Engineer / Manager.

Borrow Pits and Quarries (PC-2)

ID	Mitigation
PC-2.01	Access to abandoned borrow pits and quarries shall be managed in accordance with the Access Management Plan.
PC-2.02	All equipment and structures shall be removed from borrow pits prior to abandonment.
PC-2.03	Borrow pits and quarries shall be designed, constructed and operated in compliance with Mines and Minerals Act.
PC-2.05	Borrow pits and quarries shall not be located within established buffer zones and setback distances from identified Environmentally Sensitive Sites.
PC-2.06	Drainage water from borrow pits and quarries shall be diverted through vegetated areas, existing drainage ditch(s) or employ a means of sediment control prior to entering a waterbody.
PC-2.07	Erosion protection and sediment controls shall be put in place before borrow pit excavation commences, when required as determined by the resident Engineer/Manager in consultation with the NGC Environmental Specialist.
PC-2.08	Fuel storage shall not be permitted near stockpiles outlined in PC 2.21.
PC-2.09	Garbage, debris or refuse shall not be discarded into borrow pits and quarries.
PC-2.10	Only water and approved dust suppression products shall be used to control dust on access roads where required. Oil or petroleum products shall not be used.
PC-2.11	Organic material, topsoil and subsoil with-in borrow pits and quarries shall be stripped and stockpiled for use in future site rehabilitation.
PC-2.13	Signs shall be posted at borrow pits and quarries to warn all persons of safety hazards.
PC-2.14	Surface drainage shall be redirected away from the borrow pits and quarries before excavation commences where possible.
PC-2.17	Vegetation in active Manitoba Hydro permitted borrow pits and quarries shall be maintained as per the Rehabilitation/ and Vegetation Management Plan
PC-2.19	Borrow pits and quarries shall not be permitted within established buffer zones and setback distances from waterbodies, wetlands, and riparian areas.
PC-2.20	Discharges from dewatering operations shall be carried out so that it avoids entering natural water systems, unless sediment is controlled.
PC-2.21	The Site Environment Officer shall inspect borrow pits and quarries prior to decommissioning to evaluate adherence to environmental protection measures and to document areas of potential contamination.
PC-2.22	The Site Environmental Officer shall inspect rehabilitated borrow pits and quarries in accordance with the site Reclamation Plan to assess the success of re-vegetation and to determine if additional rehabilitation is required.
PC-2.23	Borrow pits shall be accessed using existing access routes and rights-of-way where possible. Acceptance of the access location by the Resident Engineer / Manager shall be required.

Burning (PA-2)

ID	Mitigation
PA-2.01	All occurrences of fire spreading beyond the debris pile shall be reported immediately in accordance with work permit conditions
PA-2.02	Any residue or unburned materials remaining post-burn is not to encumber operations or re-vegetating activities.
PA-2.04	Burning of solid wastes including kitchen wastes and treated wood shall not be permitted.
PA-2.05	Burning shall be monitored to ensure that fires are contained and subsequent fire hazards are not present. Post season all burn piles shall be scanned for hot spots using infrared scanning technology
PA-2.06	Burning shall not be carried out within riparian buffer zones or setbacks for stream crossings or waterbodies.
PA-2.07	Burning shall only be carried out in accordance with provincial work permits. A Burning Permit is required between April 1st and November 15.
PA-2.08	Debris and wood chip piles located near habitation or highways shall only be burned when weather conditions are favorable to ensure the safe dispersal of smoke and in accordance with burning permits where applicable.
PA-2.09	Debris piles scheduled for burning shall be piled on mineral soils where possible.
PA-2.10	Firefighting equipment required by legislation, guidelines and contract specifications shall be kept on site and maintained in serviceable condition during burning.
PA-2.11	Slash shall be piled in a manner that allows for clean, efficient burning of all material. Mixing soil into the slash is to be avoided.

Clearing (PA-3)

ID	Mitigation
PA-3.01	Riparian Buffers shall be a minimum of 30m and increase in size based on slope of land entering waterway. (See Riparian Buffer Table 6.3. Within these buffers shrub and herbaceous understory vegetation shall be maintained along with trees that do not violate Manitoba Hydro Vegetation Clearance Requirements.
PA-3.02	Access to clearing areas shall utilize existing roads and trails to the extent possible. Acceptance of the access location by the Resident Engineer / Manager shall be required.
PA-3.03	All clearing and construction equipment is to remain within the bounds of access routes and the Project footprint identified.
PA-3.07	Cleared trees and woody debris shall not be pushed into or adjacent to standing timber, wetlands or waterbodies.
PA-3.08	Clearing activities shall be carried out in accordance with contract specifications
PA-3.09	Clearing and disturbance and equipment use shall be limited to the project footprint and associated access routes.
PA-3.10	Clearing shall not be permitted within established setbacks for bird nesting and rearing during established timing windows. Clearing shall avoid the sensitive breeding period for birds between April 1 and August 31 of any construction year.
PA-3.11	Clearing within environmentally sensitive areas, not designated for organic removal shall be carried out in a manner that minimizes disturbance to existing organic soil layer.
PA-3.13	Construction vehicles, machinery and heavy equipment shall not be permitted in designated machine-free zones except at designated crossings.
PA-3.14	Danger trees shall be flagged/marked for removal using methods that do not damage soils and adjacent vegetation.
PA-3.16	In locations where grubbing and vegetation stripping is not required, existing low growth vegetation such as grasses, forbs and shrubs shall be maintained to the extent possible; disturbance to roots and adjacent soils shall be minimized.
PA-3.17	Machine clearing shall remove trees and brush with minimal disturbance to existing organic soil layer using only "V" or "K-G" type blades, feller-bunchers and other means approved by the Resident Engineer / Manager.
PA-3.18	Property limits, right-of-way boundaries, buffers and sensitive areas (where applicable) shall be clearly marked with stakes and/or flagging tape prior to clearing.
PA-3.20	Slash piles shall be placed at least 15 m from forest stands.
PA-3.21	Slash piles shall not be placed on the surface of frozen waterbodies and shall not be located within established setbacks from waterbodies or within the ordinary high water mark.
PA-3.22	The Contract "Engineer" or Resident Engineer / Manager shall issue a stop work order if extreme wet weather or insufficient frost conditions results in soil damage from rutting, and soil erosion is resulting in sedimentation of adjacent waterbodies.
PA-3.23	Trees containing active nests and areas where active animal dens or burrows are encountered shall be left undisturbed until unoccupied.
PA-3.24	Trees shall be felled toward the middle of rights-of-way or cleared area to avoid damage to standing trees. Trees shall not be felled into waterbodies.
PA-3.25	Vegetation shall be removed by mechanical means except where other selective clearing methods are stipulated at identified Environmentally Sensitive Sites.
PA-3.26	Where practical, merchantable timber shall be salvaged and brought to market. As per Annual Harvest Plan, timber that is not salvaged shall be piled and burned in accordance with timing windows, or permit conditions
PA-3.27	Chemical control of vegetation is not permitted during clearing.

Demobilizing and Cleaning Up (PA-4)

ID	Mitigation
PA-4.01	Temporary buildings, structures, trailers, equipment, utilities, waste materials, etc., shall be removed from construction areas and sites when work is completed. Foundations that are determined to be "clean fill" may be covered and abandoned.
PA-4.02	Construction access roads/trails that are no longer required shall be decommissioned and rehabilitated to prevent access.
PA-4.04	Construction areas no longer required shall be demobilized and rehabilitated in accordance with Rehabilitation and Vegetation Management Plan and/or provincial regulations (ie quarries and borrow sites)
PA-4.05	Petroleum product and other hazardous substances storage areas shall be cleaned up, assessed and, if necessary, remediated in accordance with provincial guidelines and Manitoba Hydro guidelines.
PA-4.06	Stream crossings and drainages shall be left free of obstructions so as not to impede natural runoff.
PA-4.07	Manitoba Hydro shall inspect decommissioned construction areas and sites after demobilization and clean-up for adherence to environmental protection measures and effectiveness.
PA-4.01	Buildings, structures, trailers, equipment, utilities, waste materials, etc., shall be removed from construction areas and sites when work is completed. Foundations that are determined to be "clean fill" may be covered and abandoned.

Draining (PA-5)

ID	Mitigation
PA-5.01	Construction activities shall not block natural drainage patterns by construction. The practicality and feasibility of the works shall be at the determination of the Resident Engineer / Manager in consultation with the Site Environmental Officer
PA-5.02	Culverts shall be installed and maintained in accordance with Manitoba Stream Crossing Guidelines and Fisheries and Oceans Canada Operation Statement on Culvert Maintenance and relevant provincial and municipal acts, regulations and bylaws.
PA-5.03	Dewatering from construction activities shall be directed into vegetated areas, existing drainage ditch(s) or a means of sediment control at such a rate and that shall 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 shall be diverted through vegetated areas, existing drainage ditch(s) or a means of sediment control prior to entering a waterbody.
PA-5.05	Erosion protection and sediment control shall be provided in accordance with the Erosion Protection and Sediment Control Plan.
PA-5.06	Existing, natural drainage patterns and flows shall be identified and maintained to the extent possible.
PA-5.07	No debris or slash is allowed to be placed in drainage channels/ditches
PA-5.08	Drainage ditches shall be provided with elevation controls to prevent water ponding.
PA-5.09	Drainage ditches and culverts shall be installed during periods with minimal or no stream flows.
PA-5.10	Drainage channels and ditches shall be identified and flagged prior to construction.
PA-5.11	Disturbance of natural drainages including seepage areas, discharge and recharge areas, wetlands, and ephemeral and permanent watercourses shall be avoided.
PA-5.12	Where construction must be carried out within a drainage channel, water shall be diverted around the work until completed in accordance with the contract specifications.
PA-5.13	Dewatering of excavations or alterations to existing drainage patterns shall be done so that it avoids entering natural water systems unless sediment is controlled.

Drilling (PA-6)

ID	Mitigation
PA-6.01	Abandoned drill holes shall 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 shall not be serviced within 100 m of waterbodies or riparian areas.
PA-6.04	Drilling fluids and waste materials shall be contained and not allowed into waterbodies, riparian areas or wetlands.
PA-6.05	Drilling in Environmentally Sensitive Sites and associated buffers and setbacks shall not be permitted unless approved by Resident Engineer/Manager in consultation with the NGC Environmental Specialist.
PA-6.08	Spill control and clean-up equipment shall be provided at all drilling locations.
PA-6.09	The drilling contractor shall ensure that equipment and materials are available on site for sealing drill holes.
PA-6.10	The drilling contractor shall inspect drilling equipment and machinery for fuel and oil leaks prior to arrival at the project site, and shall inspect for fuel and oil leaks and spills regularly.
PA-6.11	Where there is potential for mixing of surface and ground water, precautions shall be taken to prevent the interconnection of these waters.

Emergency Response (EI-2)

ID	Mitigation
EI-2.01	All fires shall be reported in accordance with fire reporting procedures in the Emergency Preparedness and Response Plan.
EI-2.02	All spills at construction sites shall be reported in accordance with provincial legislation and guidelines , and Manitoba Hydro Guidelines.
EI-2.03	All vehicles hauling petroleum products shall carry spill containment and clean-up equipment.
EI-2.04	Clean-up and the disposal of contaminated materials shall be managed in accordance with provincial guidelines and Manitoba Hydro guidelines.
EI-2.06	Emergency spill response and clean-up materials and equipment shall be available at construction sites, marshalling yards, fuel storage facilities and standby locations.
EI-2.07	Fire extinguishers shall be mounted on buildings at locations where they shall be most readily accessible. Safety Officers shall conduct annual inspections of fire extinguishers.
EI-2.09	Post audit assessments shall be carried out for all reported major spills and fires to ensure that procedures are followed and plans remain effective.
EI-2.10	Project emergency response and evacuation procedures in the Emergency Preparedness and Response Plan shall be adhered to in the event of forest fires.
EI-2.11	Reasonable precautions shall 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 this site.
EI-2.14	The Emergency Preparedness and Response Plan shall be prepared by the Contractor, and approved by the Resident Engineer / Manager prior to construction.
EI-2.15	The Manitoba Hydro hazardous materials incident report form shall be completed when reporting a spill.
EI-2.16	The Area Spill Response Coordinator shall be notified of hazardous substance releases immediately in accordance with the Emergency Preparedness and Response Plan.

Erosion Protection and Sediment Control (EI-3)

ID	Mitigation
EI-3.01	Accumulated sediment shall be removed from silt fences and other barriers in accordance with the Erosion Protection and Sediment Control Plan to ensure proper functioning.
EI-3.02	Construction activities shall be suspended during extreme wet weather events where erosion protection and sediment control measures are compromised.
EI-3.03	Contractor specific Erosion Protection and Sediment Control Plans shall be prepared, approved by the Contract "Engineer" or Resident Engineer / Manager prior to construction and updated annually.
EI-3.04	Erosion protection and sediment control installations shall only be removed after disturbed areas are protected and sediments are disposed of in accordance with Erosion Protection and Sediment Control Plan.
EI-3.07	Orientation for Contractor and Manitoba Hydro employees working in construction areas shall include erosion protection and sediment control techniques and procedures.
EI-3.09	The Contractor shall be responsible for modifying erosion protection and sediment control installations to ensure continued effectiveness.
EI-3.10	The Contractor shall communicate erosion protection and sediment control information to all project staff and a copy shall be made available at the project site.
EI-3.12	The Site Environmental Officer shall make inspections of decommissioned project areas and sites in accordance with the Site Rehabilitation Plan to ensure that environmental protection measures are effective and that any deficiencies are addressed.

Fish Protection (EC-3)

ID	Mitigation
EC-3.01	Construction activities shall not be carried out within established buffer zones and setback distances from waterbodies, wetlands and riparian areas without prior written notification of Fisheries and Oceans Canada.
EC-3.02	Disturbances to waterbodies, shorelines, riparian areas, etc. shall be rehabilitated immediately upon completion of construction activities.
EC-3.03	Erosion protection and sediment control measures shall be put in place at all project locations where surface drainage is likely to flow into fish bearing waters.
EC-3.04	Fish and fish habitat shall be protected in accordance with federal legislation and federal and provincial guidelines.
EC-3.05	MCWS and Fisheries and Oceans Canada (DFO) shall be notified if beaver dams must be cleared along rights-of-ways and along access roads and trails. Clearing of dams shall be carried out in accordance of the Fisheries and Oceans Canada Operational Statement
EC-3.06	Project personnel shall be prohibited from fishing at project locations or along rights-of-way.
EC-3.07	The Site Environmental Officer shall inspect rehabilitated riparian areas to assess the success of re-vegetation and to determine if additional rehabilitation is required.

Grading (PA-7)

ID	Mitigation
PA-7.02	Grading for gravel pads for construction areas and access roads shall 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 shall be in accordance with the Rehabilitation and Vegetation Management Plan.
PA-7.04	Grading shall not be permitted within established buffer zones and setback distances from waterbodies.
PA-7.05	Grading shall only be permitted within rights-of-ways and construction areas.
PA-7.06	Where practical, gravel pads shall be graded so the surface runoff is directed away from waterbodies, riparian areas and wetlands. The practicality and feasibility are determine by Resident Engineer/Manager in consultation with the NGC Environmental Specialist
PA-7.07	Required erosion protection and sediment control measures shall be put in place prior to grading in accordance with the Erosion Protection and Sediment Control Plan.

Groundwater (EC-4)

ID	Mitigation
EC-4.01	Potable water samples shall be collected every two weeks and submitted for analysis according to provincial sampling and analysis protocol.
EC-4.04	Where groundwater is used for project purposes groundwater usage shall be monitored.

Grubbing (PA-8)

ID	Mitigation
PA-8.01	Construction areas containing soil with high silt content, artesian springs or areas of previous erosion shall receive special erosion protection and sediment control techniques.
PA-8.02	Construction areas requiring extensive grubbing shall be stabilized as soon as possible to minimize erosion.
PA-8.03	Grubbing shall be halted during heavy precipitation events when working in areas of finely textured soils.
PA-8.04	Grubbing shall not be permitted within 2 m of standing timber to prevent damage to root systems and to limit the occurrence of blow down.
PA-8.06	Stockpiled materials from grubbing shall not block natural drainage patterns.
PA-8.07	Unless required for the work, the extent of grubbing shall be minimized to the extent possible.
PA-8.08	When not under frozen conditions, erosion protection and sediment control measures shall be put in place prior to grubbing in accordance with the Erosion Protection and Sediment Control Plan.
PA-8.09	Windrows of grubbed materials shall be piled at least 15 m from standing timber.

Hazardous Materials (EI-4)

ID	Mitigation
EI-4.02	Access to hazardous materials storage areas shall be restricted to authorized and trained Contractor and Manitoba Hydro personnel.
EI-4.03	An inventory of WHMIS controlled substances shall be prepared by the Contractor and maintained at each project site and updated as required by provincial legislation.
EI-4.04	Bulk waste oil shall be stored in approved aboveground tanks provided with secondary containment in accordance with provincial legislation.
EI-4.05	Containers of hazardous substances stored outside shall be labelled, weatherproof, placed on spill containment pallets and covered by a weatherproof tarp.
EI-4.06	Contractor personnel shall be trained and certified in the handling of hazardous materials including emergency response procedures in accordance with provincial legislation.
EI-4.07	Contractor personnel shall receive WHMIS training in accordance with provincial legislation.
EI-4.08	Controlled substances shall be labeled in accordance with WHMIS requirements. Required documentation shall be displayed and current Materials Safety Data Sheets shall be available at each project site.
EI-4.09	Empty hazardous waste containers shall be removed to a licensed or approved disposal site by the Contractor.
EI-4.10	Hazardous materials storage sites shall be secured, and signs shall be posted that include hazard warnings, contacts in case of a release, access restrictions and under whose authority the access is restricted.
EI-4.11	Hazardous materials shall be adequately contained and shall be protected from wind and rain to prevent deposition of fine particles or dust into watercourses through runoff.
EI-4.12	Hazardous materials and WHMIS inventories shall be completed prior to construction. Inventories shall be updated in accordance with regulatory requirements.
EI-4.14	Hazardous material and petroleum product storage areas (including coke materials for ground electrode facilities) shall have the following features: maximum separation distance from sensitive features (watercourses/bodies); clear identification of the material.
EI-4.15	All hazardous materials including petroleum products shall be transported according to the procedures prescribed by provincial legislation.
EI-4.16	Hazardous waste materials shall be segregated and stored by type.
EI-4.17	Indoor storage of flammable and combustible substances shall be in fire resistant and vented enclosed storage area or building in accordance with national codes and standards.
EI-4.19	Non-hazardous products shall 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 shall include hazardous materials awareness.
EI-4.21	Pesticide storage shall be in accordance with provincial legislation and Manitoba Hydro guidelines.
EI-4.22	The Contractor shall 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 shall monitor hazardous substance containers regularly for leaks and to ensure that labels are displayed.
EI-4.24	The Site Environmental Officer shall make routine inspections of hazardous substance storage sites to ensure that environmental protection measures are implemented and effective.
EI-4.25	Waste oil shall be transported by licensed carriers to licensed or approved waste oil recycling facilities.
EI-4.26	Wet batteries shall be stored and transported to licensed or approved waste recycling facilities.

Heritage Resources (EC-5)

ID	Mitigation
EC-5.01	All archaeological finds discovered during site preparation and construction shall be left in their original position until the Project Archaeologist is contacted and provides instruction.
EC-5.02	Construction activities shall not be carried out within established buffer zones for heritage resources except as approved by Project Archaeologist.
EC-5.03	Environmental protection measures for heritage resources shall 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 shall include heritage resource awareness and training including the nature of heritage resources and the management of any resources encountered.
EC-5.05	Orientation information shall include typical heritage resource materials and reporting procedures.
EC-5.06	The Contractor shall report heritage resource materials immediately to the Resident Engineer / Manager and shall cease construction activities in the immediate vicinity until the Project Archaeologist is contacted and prescribes instruction.
EC-5.07	The Culture and Heritage Resource Protection Plan shall be adhered to during Preconstruction and construction activities.
EC-5.08	The Site Environmental Officer shall inspect borrow pits and other excavations for the presence of heritage resource materials.

Management Measures (MM)

ID	Mitigation
MM-01	All licenses, permits, contracts, project specifications, guidelines and other applicable documents shall be obtained and in the possession of both the Contractor and Manitoba Hydro prior to commencement of work.
MM-02	All project participants shall ensure that project activities are carried out in compliance with applicable legislation, guidelines, contractual obligations and environmental protection plan provisions.
MM-03	Environmental concerns shall be identified and discussed at planning meetings on an as required basis.
MM-05	Manitoba Hydro shall contact local municipal authorities prior to project start-up to ensure that all environmental concerns are identified and addressed by the Contractor.
MM-08	Manitoba Hydro shall 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 shall be held regularly for the ongoing review of environmental and safety issues.
MM-12	Relevant documents including licenses, permits, approvals, legislation, guidelines, environmental protection plans, orthophotos maps, etc., shall be made available to all project participants.
MM-13	Response to enforcement actions by regulatory authorities shall be in accordance with Manitoba Hydro policy P602.
MM-15	The Contractor shall review terms and conditions of all authorizations, contract specifications, agreements, etc., prior to project start-up or as authorizations are acquired and shall discuss any questions or concerns with Manitoba Hydro.

Staging Areas (PC-5)

ID	Mitigation
PC-5.01	Contractor employees responsible for receipt and distribution of hazardous substances shall be trained in handling and transportation of dangerous goods, and WHMIS.
PC-5.03	Erosion protection, sediment control and drainage management measures shall be put in place prior to construction.
PC-5.04	Fire breaks shall be established a minimum of six meters around staging and work storage areas where there is a risk of fire.
PC-5.05	Garbage and debris shall be stored in approved containers, sorted for recycling and disposed of at a licensed or approved waste disposal site.
PC-5.06	Hazardous materials entering and hazardous wastes leaving the staging and work storage areas shall be inventoried and provided to Manitoba Hydro.
PC-5.07	Hazardous materials shall be stored in accordance with provincial legislation, and provincial and national codes and standards.
PC-5.08	Staging and work storage areas shall be located based on criteria that consider soils, topography, land form type, permafrost, wildlife habitat and other environmental factors.
PC-5.10	Staging and work storage areas shall be located, constructed, operated and decommissioned in accordance with contract specifications and in accordance with the Rehabilitation and Vegetation Management Plan.
PC-5.11	Once staging and work storage areas are no longer required, structures, equipment, materials, fences, etc. shall be dismantled and moved to storage or a new location.
PC-5.12	Organic material, topsoil and sub-soil stripped during site preparation shall be stockpiled separately for later use in site rehabilitation.
PC-5.13	Petroleum products shall only be stored, handled and dispensed in designated areas within staging and work storage areas in accordance with provincial legislation and guidelines.
PC-5.14	Spill control and clean-up equipment to be located at designated areas within staging and work storage areas.
PC-5.16	Vegetation control at marshalling yards shall be in accordance with Rehabilitation and Vegetation Management Plan.
PC-5.17	Vehicle, machinery and equipment maintenance and repairs shall be carried out in designated areas within staging and work storage areas.
PC-5.18	Hazardous waste substances, fuel containers and other materials shall be stored in approved containers and transported to licensed or approved waste disposal facilities by a licensed carrier.
PC-5.19	Welding mats shall be used to minimize the risk of fire.
PC-5.20	The Site Environmental Officer shall inspect rehabilitated staging and work storage areas in accordance with the site Rehabilitation and Vegetation Plan to assess the success of re-vegetation and to determine if additional rehabilitation is required.

Petroleum Products (EI-5)

ID	Mitigation
EI-5.01	Aboveground tanks shall be equipped with overfill protection and spill containment consisting of perimeter dykes or secondary containment in the tank design.
EI-5.02	All aboveground petroleum product tanks with a capacity greater than 5,000 L shall be registered by the contractor with Manitoba Conservation and Water Stewardship and have a valid operating permit.
EI-5.03	Construction, installation or removal of petroleum product storage tank systems shall only occur under the supervision of a registered licensed petroleum technician.
EI-5.04	Containment measures, such as secondary containment (i.e., berms) shall be used at all locations where stationary oil-filled equipment is used.
EI-5.05	Contractors shall 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	Fuelling of equipment or portable storage tanks shall be done in designated areas.
EI-5.07	Fuelling operations require the operator to visually observe the process 100% of the time.
EI-5.08	If dykes are used, the containment areas shall be dewatered after rainfall events and the containment water disposed of as specified in contract specifications.
EI-5.09	Once petroleum product storage areas are no longer required, a Phase I and where required a Phase II Environmental Site Assessment shall be carried out to determine if remediation is required in accordance with national standards.
EI-5.10	Only approved aboveground petroleum storage tanks shall be used during the construction phase of the project. No underground tanks shall be permitted.
EI-5.11	Orientation for Contractor and Manitoba Hydro employees working in construction areas shall include petroleum product storage and handling awareness.
EI-5.12	Petroleum product dispensing systems shall be secured and locked by authorized personnel when not in use by authorized personnel.
EI-5.13	Petroleum product inventories shall 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 Conservation and Water Stewardship upon request.
EI-5.14	Petroleum product storage containers in excess of 230 L shall be located on level ground and shall 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 shall be equipped with fire suppressant equipment and products.
EI-5.16	Petroleum product storage tanks shall be protected from vehicle collisions by concrete filled bollards.
EI-5.17	Petroleum product storage shall be located a minimum of 100 m from the ordinary high water mark of waterbodies, riparian areas or wetlands.
EI-5.18	Petroleum products stored outside shall be in waterproof and labelled containers, placed on spill containment pallets.
EI-5.20	Petroleum products shall display required signage, placards and labelling, and shall be transported, handled and stored in accordance with provincial legislation.
EI-5.21	Petroleum products shall only be stored and handled within designated areas at construction camps and marshalling yards.
EI-5.22	Portable petroleum product storage containers shall be placed on spill trays with a capacity of 110% of the largest container when not in use. Water 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 shall be securely fastened to the vehicle during transport and fuelling operations.
EI-5.25	Spill trays shall remain impervious at very low temperatures (-45 C) and have accumulated precipitation removed regularly.
EI-5.26	The Contractor shall 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 shall inspect all petroleum product storage tanks and containers regularly for leaks, and product inventories shall be recorded and retained for inspection by Manitoba Hydro and Manitoba Conservation and Water Stewardship.

Petroleum Products (EI-5)

EI-5.28	There shall be no ignition sources in and adjacent to petroleum product storage areas.
EI-5.29	Transfer of petroleum products between storage areas and work sites shall not exceed daily requirements and shall be in accordance with provincial legislation and guidelines.
EI-5.30	Used petroleum products (including empty containers) shall be collected and transported to a licensed oil recycling facility in approved storage containers.
EI-5.31	Vehicles hauling petroleum products shall carry equipment and materials for emergency spill containment and clean-up.
EI-5.32	Warning signs shall be posted in visible locations around petroleum product storage areas. Signs shall indicate hazard warning, contact in case of a spill, access restrictions and authority.

Rehabilitating and Re-vegetation (PA-9)

ID	Mitigation
PA-9.01	Construction areas no longer required shall be re-contoured, stabilized, re-vegetated and restored to near natural conditions in accordance with Rehabilitation and Vegetation Management Plan
PA-9.02	Natural re-vegetation shall 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 shall be stockpiled separately for future site rehabilitation.
PA-9.04	Rehabilitation of construction areas shall incorporate erosion protection and sediment control measures in accordance with the Erosion and Sediment Control Plan as required.
PA-9.05	Rehabilitation Plans shall include objectives for restoration of natural conditions, erosion protection, 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 shall be used to assist re-vegetation of disturbed areas to control erosion or prevent invasion of non-native species. The mixtures shall not contain non-native or invasive species.
PA-9.07	Stockpiled organic materials, topsoil and subsoil shall be spread over restored construction areas to encourage re-vegetation.
PA-9.08	Stockpiled soils shall be protected from wind erosion by wetting and if necessary, by covering.
PA-9.09	Soil/site preparation consisting of scarification, grading and fertilizing shall be conducted if necessary to re-establish vegetation.
PA-9.10	Highly erodible eolian (wind-blown) deposits shall be stabilized immediately after disturbance by the addition of surface cover.
PA-9.11	Rehabilitation measures for temporary stream crossings shall be implemented as soon as possible after crossings are removed.
PA-9.12	Excavations shall be left at a maximum slope of 4:1 (horizontal: vertical) for erosion and sediment control purposes.
PA-9.13	Compensatory measures such as tree planting and habitat enhancement shall be considered for construction areas and sites where important habitat is removed.
PA-9.14	The Site Environmental Officer shall inspect rehabilitated construction areas in accordance with the Rehabilitation and Vegetation Management Plan to assess effectiveness and determine if additional restoration activities are required.
PA-9.15	Rehabilitation Plans for borrow pits and quarries shall also be provided to Manitoba Industry, Economic Development and Mines.

Stream Crossings (PC-9)

ID	Mitigation
PC-9.02	Construction of temporary crossings shall follow the Fisheries and Oceans Canada Manitoba Operational Statement for Temporary Stream Crossings.
PC-9.03	Construction of transmission line stream crossings shall follow the Fisheries and Oceans Canada Manitoba Operational Statement for Overhead Line Construction.
PC-9.04	Where applicable, the Fisheries and Oceans Canada Manitoba Operational Statement for Isolated or Dry Open Cut Stream Crossings and/or High-pressure Directional Drilling shall be adhered to.
PC-9.05	Approach gradients to waterbodies shall not exceed 5% to control erosion and minimize sedimentation. This gradient may be achieved using log ramps or other methods, but shall not include grading.
PC-9.06	Vehicles, machinery and equipment working on watercourse crossings shall be kept in good working condition and free of fluid leaks.
PC-9.07	Existing woody debris shall not be removed from stream beds unless required for the stream crossing and approved by the Site Environmental Officer.
PC-9.08	Aggregate materials shall not be removed from the bed or bank of any stream or waterway.
PC-9.09	Branches, sawdust, soil or organic materials shall not to be used as bank or bridge fill. Only approved materials including bundled logs shall be used at stream crossings.
PC-9.10	Right-of-way and access road planning shall minimize the number of watercourse crossings.
PC-9.11	Only clean, well-graded aggregate fill shall be used to backfill excavations adjacent to watercourse crossings.
PC-9.12	Erosion protection and sediment control measures shall be put in place prior to the commencement of construction activities.
PC-9.13	The bed or banks of watercourses shall not be disturbed during removal of snow fills.
PC-9.14	Riparian vegetation along rights-of-way shall be maintained in accordance with the Fisheries and Oceans Canada Manitoba Operational Statement for Maintenance of Riparian Vegetation in Existing Rights-of-Way.
PC-9.15	Disturbed stream banks shall be stabilized and re-vegetated with low growth vegetation as soon as practical.
PC-9.16	The Site Environmental Officer shall be present when winter stream crossings are being decommissioned prior to breakup.
PC-9.17	The Site Environmental Officer shall inspect rehabilitated watercourse crossings in accordance with the site Rehabilitation and Vegetation Management Plan to assess the success of re-vegetation and to determine if additional rehabilitation is required.
PC-9.18	Saturated marshy floodplains of streams shall be avoided as watercourse crossings to the extent possible. Where marshy floodplain areas must be crossed, the work shall be carried out under frozen conditions.
PC-9.19	Riparian Buffers shall be a minimum of 30m and increase in size based on slope of land entering waterway. (See Riparian Buffer Table 6.3) Within these buffers shrub and herbaceous understory vegetation shall be maintained along with trees that do not violate Manitoba Hydro Vegetation Clearance Requirements.
PC-9.20	Construction vehicles, machinery and heavy equipment shall not be permitted in designated machine-free zones except at designated crossings.

Stripping (PA-10)

ID	Mitigation
PA-10.01	Construction areas containing soil with high silt content, artesian springs or areas of previous erosion shall receive special erosion protection and sediment control techniques.
PA-10.02	Erosion protection and sediment control measures shall put be 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 shall be stored on liners or in designated areas where 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. Soils should be replaced in the reverse order to which they were removed.
PA-10.05	Stockpiled materials from stripping shall not block natural drainage patterns.
PA-10.07	Stripping shall 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 shall stabilize construction areas requiring extensive stripping as soon as possible to minimize erosion.
PA-10.09	Stripping shall be minimized to the extent possible

Transmission Towers and Conductors (PC-10)

ID	Mitigation
PC-10.05	Transmission towers shall not be located within established buffer zones and setback distances from waterbodies, wetlands and riparian areas, where possible. The practicality and feasibility of the works shall be at the determination of the Resident Engineer/Manager.
PC-10.06	Transmission tower construction shall not be permitted within established buffer zones for bird nesting and rearing during established timing windows.
PC-10.07	Transport of equipment and materials for tower construction shall be along pre-defined access corridors
PC-10.08	Transmission towers shall not be located within established buffer zones and setback distances from sensitive sites including, protected areas and heritage resources whenever feasible.

Treated Wood (EI-8)

ID	Mitigation
EI-8.01	Salvage and disposal of treated wood products shall be in accordance with Manitoba Hydro guidelines.
EI-8.02	Small quantities of surplus or unwanted treated wood products may be disposed of as domestic waste products at licensed or approved waste disposal sites.
EI-8.03	Treated wood products shall not be used indoors and shall not be burned.
EI-8.04	Treated wood shall be delivered to project locations or construction sites on an as required basis to reduce storage time in the field.
EI-8.05	Use of treated wood shall be in accordance with provincial legislation and guidelines, and Manitoba Hydro guidelines.
EI-8.06	If treated wood products are sold the purchaser shall be advised about potential adverse effects and shall sign a release.
EI-8.07	The Site Environmental Officer shall inspect the use of treated wood to ensure that environmental protection measures are implemented and effective.
EI-8.08	Creosote-treated wood shall not be used. If existing creosote-treated wood is encountered it shall be disposed of as hazardous waste by a licensed contractor at an approved waste disposal site.
EI-8.09	CCA or other approved treated wood products shall be used if avoidance of construction in aquatic environments is not possible.
EI-8.10	Treated wood shall be kept in use for as long as possible or reused for other projects.

Vehicle and Equipment Maintenance (EI-9)

ID	Mitigation
EI-9.01	An Emergency Preparedness and Response Plan and spill control and clean-up equipment shall be provided at all designated vehicle, equipment and machinery maintenance areas.
EI-9.02	Vehicle, equipment and machinery maintenance repairs procedures shall include containing waste fluids and shall use drip trays and tarps where required.
EI-9.04	Vehicle, equipment and machinery maintenance and repairs shall 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 shall perform a daily inspection for fuel, oil and fluid leaks and shall immediately shutdown and repair any leaks found. All machinery working near watercourses shall be kept clean and free of leaks.
EI-9.06	Vehicles transporting dangerous goods or hazardous products shall display required placards and labelling in accordance with provincial legislation and Manitoba Hydro guidelines.
EI-9.07	Vehicles, equipment and machinery must arrive on site in clean condition free of fluid leaks and weed seeds.
EI-9.08	Vehicles, equipment and machinery that carry fuel, hydraulic oil and other petroleum products shall also carry spill control and clean-up equipment and materials.
EI-9.01	An Emergency Preparedness and Response Plan and spill control and clean-up equipment shall be provided at all designated vehicle, equipment and machinery maintenance areas.

Waste Management (EI-10)

ID	Mitigation
EI-10.01	A Contract specific Waste and Recycling Management Plan shall be prepared by the Contractor, approved by the Resident Engineer / Manager prior to construction and updated annually.
EI-10.02	Bear-proof waste containers and/or electric fencing shall be used in rural project locations.
EI-10.03	Construction sites shall be kept tidy at all times and bins shall be provided wherever solid wastes are generated.
EI-10.04	Indiscriminate burning, dumping, littering or abandonment shall not be permitted.
EI-10.05	Kitchen wastes shall be stored in closed containers to minimize wildlife interactions.
EI-10.06	Solid waste materials shall be collected and transported to a licensed or approved waste disposal facility.
EI-10.07	Waste materials remaining at snow disposal sites after melting shall be disposed of at a licensed or approved landfill.
EI-10.08	The Site Environmental Officer shall make regular inspections of waste collection, storage and handling at construction sites to ensure that environmental protection measures are implemented and effective.
EI-10.09	The Contractor must demonstrate that sufficient capacity exists at waste disposal grounds by obtaining approval from the operator prior to use of that facility.

Wildlife Protection (EC-9)

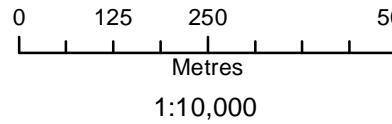
ID	Mitigation
EC-9.01	Any wildlife killed or injured by vehicles shall be reported to Manitoba Conservation and Water Stewardship.
EC-9.04	Clearing shall occur outside breeding bird timing windows. See Table 6-1
EC-9.07	Hunting and harvesting of wildlife by project staff shall not be permitted while working on the project sites.
EC-9.09	Manitoba Conservation and Water Stewardship shall be notified if animal traps are encountered and must be removed for project activities.
EC-9.11	No firearms shall be permitted at construction sites.
EC-9.12	Orientation for Contractor and Manitoba Hydro employees shall include awareness of environmental protection measures for wildlife and wildlife habitat.
EC-9.13	Problem wildlife shall be reported immediately to Manitoba Conservation and Water Stewardship.
EC-9.15	Trees containing large nests of sticks and areas where active animal dens or burrows are encountered shall be left undisturbed until unoccupied. Artificial structures for nesting may be provided if unoccupied nests must be removed.
EC-9.16	Vehicles shall not exceed posted speed limits and wildlife warning signs may be installed in high density areas and at known crossings locations.
EC-9.18	Wildlife and wildlife habitat shall be protected in accordance with provincial and federal legislation and provincial and federal guidelines.
EC-9.19	Wildlife shall not be fed, befriended or harassed at construction areas.
EC-9.20	Construction activities shall not be carried out within established buffer zones and setback distances for wildlife species.

7.0 MAP SHEETS AND MITIGATION TABLES

The map sheets and specific mitigation tables are presented in the following pages. The map sheets provide an overview of Environmentally Sensitive Sites (ESS), while the associated mitigation tables provide specific mitigation requirements related to this ESS.



Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: June 27, 2014
Version: Draft



Land Base

- Transmission Line
- Highway
- Major Road
- Local Road

Project Infrastructure

- Ground Electrode Line
- Ground Electrode Site

ESS Features

- Water Crossing

**Bipole III Transmission Project
Construction Environmental Protection Plan
Riel Ground Electrode Site
Environmentally Sensitive Site Locations**

Draft: For Discussion Purposes Only

APPENDICES

APPENDIX A – CONTACT LIST

Contact	Name	Phone Number(s)
Construction Contractor		
	Contractor Project Manager	
	Contractor Field Lead	
	Contractor Safety and Environmental Officer	
Manitoba Hydro		
	Project Manager	
	Resident Engineer/Manager	
	Contract Engineer	
	Site Environmental Officer	
	Environmental Specialist	
	Field Safety, Health and Emergency Response Officer	
	Hazardous Materials Officer	
	Area Spill Response Coordinator	
	Emergency Response Services	
	Project Archaeologist (Primary Contact)	
	Archaeologist	
Manitoba Conservation Contacts		
	District Office	
	Regional Fisheries Manager	
First Nations Contacts		

APPENDIX B – ENVIRONMENTAL LICENCES, APPROVALS AND PERMITS

Approval Required, Applicable Legislation / Regulation	Type of Approval needed	Responsibility
Dangerous Goods Handling and Transportation Act – Storage and Handling of Gasoline and Associated Products Regulation (registration of petroleum tanks)	Permit	NGC / Contractor
Environment Act Licence (Class 3)	Licence	LEA
Explosives Act (permit required for storage of explosives on site)	Permit	Contractor
Heritage Resources Act (application to conduct work if artifact is found)	Permit	LEA
Highways Protection Act (transportation of large loads)	Permit	Contractor
Rail line crossing at temporary access road intersections	Permit	Property Dept.
Mines and Minerals Act (quarry lease or permit)	Lease or Permit	NGC/Contractor
Water Rights Act	Licence	NGC
Wildfires Act (work permit)	Permit	NGC

NGC- Manitoba Hydro New Generation Construction Division

LEA- Manitoba Hydro Licensing And Environmental Assessment Department

APPENDIX C – FRAMEWORKS FOR CONTRACTOR-DEVELOPED ENVIRONMENTAL PLANS

C.1 Waste and Recycling Management Planning Framework

Introduction

The Bipole III Transmission Project (the Project) is a large scale development that has potential to generate a significant waste stream. To manage and reduce the amount of materials flowing from the construction of the Project, Manitoba Hydro shall require Waste and Recycling Management Plans (W&R) plans from construction contractors in an effort to reduce the volume of materials going to landfill and facilitate reuse and recycling. Where applicable, the W&R Plan shall also address wastes developed in the operation of work camps. This framework outlines the objectives, scope and materials to be covered in the W&R Plan required by each applicable contractor for the construction of the Bipole III Transmission Project.

Purpose of Framework

Manitoba Hydro recognizes the need to proactively address the issue of waste management. This document provides a framework to guide contractors in the preparation and implementation of a Waste and Recycling Management Plan, which is a crucial step in managing waste generation and disposal.

Objectives

Manitoba Hydro's objective for developing this Waste and Recycling Management Plan framework is to provide guidance to contractors in the development of a W&R Plan. The W&R Plan must contain the necessary components to meet regulatory requirements, applicable Acts and regulations, industry standards, and best practices in waste reduction, re-use and recycling for the Bipole III Transmission Project.

The goal of the W&R Plan is to reduce the amount of waste disposed at landfills while optimizing waste reduction, reuse and recycling activities. To obtain this goal, W&R Plans shall include strategies related to waste minimization and avoidance, appropriate waste treatment and the applicable handling, storage, collection, recycling and disposal of waste. This framework shall outline and define Manitoba Hydro's expectations for a W&R Plan to the contractor. Establishing these expectations and minimum requirements in a framework provides the contractor with the opportunity to develop more efficient processes which shall meet or exceed Manitoba Hydro's goals of waste reduction and prevention.

Definitions

For the purposes of developing a Waste and Recycling Management Plan, below are the definitions of waste and hazardous waste.

The Environment Act definition of waste is:

"waste" includes rubbish, litter, junk, or junked obsolete or derelict motor vehicles, or obsolete or derelict equipment, appliances or machinery; slimes, tailings, fumes, waste of domestic, municipal, mining, factory or industrial origin; effluent or sewage; human or animal wastes; solid or liquid manure; or waste products of any kind whatsoever or the run-off from such wastes.

The Dangerous Goods Handling and Transportation Act definition of hazardous waste is:

"hazardous waste" means a product, substance or organism that

- a) is prescribed, designated or classified as hazardous waste in the regulations, or
- b) by its nature conforms to the classification criteria for one or more classes of hazardous wastes set out in the regulations.

Plan Scope

Each W&R Plan must identify the nature of the waste generated by the contractor. Examples of waste that are expected to be produced by the Project and be covered by the W&R Plan are found in the following table. (Note: this is not an exhaustive list.)

Table C-1: Materials to be Covered by the W&R Plan

Category	Items
Hazardous waste	Motor oils, fuels, solvents, coolants, pesticides, other chemicals
Construction materials	Wood, aluminum, copper, steel, cardboard, plastic
Food services	Beverage containers (aluminum and glass), cardboard, boxboard, plastics, newsprint, office paper
Domestic solid waste	Organic material, non-recyclable waste
E-waste	Computers, circuitry, batteries
Construction equipment	Rubber tires, lead-acid batteries, hydraulic fluid, oil filters

For each waste item identified in Table C-1, the following is required:

- the waste management method to be employed (reuse, recycle, landfill);
- collection, handling, storage, treatment and transportation requirements;
- final destination (landfill, recycle depot, etc.); and
- Municipal approvals for waste destined to a licensed waste disposal ground or landfill.

Related Environmental Protection Program Documents

When contractors develop a Waste and Recycling Management Plan, the Construction Environmental Protection Plan and the Project Environmental Plan should be referenced as these plans include waste mitigation measures.

Waste Management

The Waste and Recycling Management Plan must provide a process to which a hierarchical approach is taken to waste management. The purpose of the hierarchy is to assess each waste item for opportunities to avoid waste, then opportunities to reuse, followed by opportunities to recycle prior to disposal. This hierarchy will be as follows:

- compliance with federal and provincial waste management legislation (i.e., Acts and Regulations);
- waste avoidance;
- waste re-use;
- waste recycling; and
- waste disposal (as a final option).

Prior to the start of construction, the contractor must ensure that the waste disposal grounds are willing and have the capacity to accommodate the projected waste volume. Waste disposal grounds must be registered with Manitoba Conservation and Water Stewardship and be in accordance with the Waste Disposal Grounds Regulation (150/91, July 9 1991).

Waste Management Activities

The Waste and Recycling Management Plan must also include waste management activities to address the following:

- waste avoidance, reuse and recycling;
- waste segregation, storage and handling;
- waste transport and disposal;
- tracking of waste volumes produced;
- waste monitoring and reporting; and
- spill response and reporting as per Manitoba Hydro's Spill Response and Reporting Plan.

Table C-2 reflects the expected waste stream handling capabilities for typical project worksites.

Other Plan Considerations

- Waste kept on-site must be stored in such a way as to not pose health and safety risks.
- Recyclables destined for depots in major centers and should be back-hauled to reduce transportation costs.
- Methods for disposal of cleared vegetation, including trees, shrubs and undergrowth resulting from clearing will be covered by the Project's Construction Environmental Protection Plans and through consultation with the Regional Forrester as per the licence document.
- Waste excavated material will be reused wherever possible and waste material is to be disposed of by a licensed waste contractor. Stockpiles and waste that must be stored temporarily on site will be stored on existing cleared areas away from drainage channels and slopes.

Waste and Recycling Management Plan Approval

A detailed Waste and Recycling Management Plan must be developed by the contractor and submitted for approval by the Senior Environmental Specialist in the New Generation Construction Department. The W&R plan must address all applicable issues and concerns identified in this Waste and Recycling Management Plan framework. The detailed W&R plan submitted by the contractor must include all actions needed to effectively implement the Waste and Recycling Management Plan and its waste management hierarchy.

Table C-2: Preferred Waste Management Methods

Category	Items	Preferred Waste Management Methods
Hazardous Waste	Motor oils, oil filters, lead-acid batteries, hydraulic fluid, fuels, solvents, coolants, pesticides, other chemicals and their containers	Separate hazardous waste materials by type and store them segregated from the waste stream in approved containers and containment areas.
		Ensure that staff handling wastes is trained in the handling and transportation of hazardous waste.
		Inventory and account for hazardous waste leaving collection areas.
		Transportation off-site by licensed regulated waste transporter and disposal off-site by a regulated waste receiver, for recycling or proper disposal.
Construction Materials	Aluminum, copper, steel, scrap conductors	Collected and segregated on-site, transported for off-site recycling.
	Wood - timber off cuts, pallets, wooden boxes	Minimize waste by producing or using only the amount necessary. Off cuts and pallets to be burnt on-site or disposed of in landfills licensed by MCWS with capacity to accept and separate construction wastes.
	Cardboard packing and boxes	Collected and recycled at landfill
	Plastic bags and plastic packaging	Collected and disposed of at landfill
Food Services (Non-Hazardous Waste)	Beverage containers (aluminum, glass, cardboard, boxboard, plastics, newsprint, office paper	Collected and recycled
Non-Hazardous Solid Waste	Grease Trap wastes and organic food waste	Store materials in wildlife-proof waste containers or in secure location. Waste shall be taken off-site for disposal.
Electronic Wastes	Computers, circuitry, etc.	Electronic waste shall be stored and transported off-site to a licensed e-waste receiver for recycling or disposal.
Construction Equipment	Rubber tires	Tires shall be stored and transported off-site to a licensed regulated waste receiver for recycling or disposal.

Table C-2: Preferred Waste Management Methods

Category	Items	Preferred Waste Management Methods
Excavated Material	Excess material removed during construction	<p>Refill any excavations and spread any excess over the nearby area and allow to re-vegetate.</p> <p>Waste materials shall be reused as much as practicable to construct, haul roads, pads, etc.</p>
Waste Concrete	Footing pours	<p>Minimize waste by producing only the amount necessary.</p> <p>Disposal in designated area(s) for concrete washout.</p> <p>Regularly break-up and remove hardened concrete for proper disposal in landfill or used as fill on site.</p>
Cleared Vegetation	Vegetation cleared during construction of yard sites, Access Roads and the ROW	<p>Felling, chipping, mulching or burning.</p> <p>Salvage timber on Crown Land where practical and feasible.</p> <p>Follow burning procedures for non-salvaged timber.</p> <p>Vegetation mulch/chips may be retained on site for use in mitigation and site management works (e.g., erosion control).</p> <p>Mulch/chips may be utilized by local landowners where practical and feasible.</p>

C.2 Erosion and Sediment Control Planning Framework

Introduction

Part of Manitoba Hydro's commitment to environmental protection includes the development of an Environmental Protection Program (EPP) for the Bipole III Transmission Project (the 'Project'). Aspects of this program include planning, monitoring and follow up for erosion and sediment control. This document provides the Framework for the development of Erosion and Sediment Control Plans (ESCP) by construction contractors for the project.

This Framework is intended to provide assurance to regulatory reviewers, environmental organizations, Aboriginal communities and the general public that commitments made in the Project Environmental Impact Statement (EIS) and Construction Environmental Protection Plans (CEnvPPs) will be implemented and monitored in a responsible and accountable manner.

Background

Land disturbing activities associated with the proposed construction of the Project may involve soil, rock, and vegetation removal. This surficial disturbance may result in soil erosion and/or sedimentation in the construction areas and beyond.

Erosion and sedimentation are naturally occurring processes involving the loosening, transport and deposition of soils. Erosion involves the wearing away of soil materials, caused by the action of wind or water, through detachment and transport of materials while sedimentation is the deposition of soil particles previously held in suspension by flowing water.

Water runoff is also part of the natural hydrological cycle, however, clearing, grading, and other construction activities that remove vegetation and compact the soil may result in increased runoff. Excessive runoff may cause erosion, sedimentation, or flooding.

Construction activities can result in a rapid increase in erosion and sedimentation rates that, if left uncontrolled, can reparably or irreparably harm the environment.

Purpose

It is important that land and water resources are protected from soil erosion. Manitoba Hydro recognizes the need to proactively address the issues of erosion and sedimentation. This document provides a framework to guide contractors in the preparation and implementation of an ESCP, which is a crucial step in managing and mitigating erosion and sedimentation.

Objectives

The objectives of the erosion and sediment control Framework are as follows:

- To provide a framework for erosion, sediment control and planning.
- To identify a process to develop an ESCP that meets regulatory requirements, industry standards and best practices.

- To provide guidance on the development of an ESCP that contains the necessary components to meet regulatory requirements, industry standards and best practices.

Roles and Responsibilities

The following table summarizes the roles and responsibilities of the main participants in the ESCP:

Manitoba Hydro	<p>Ultimate responsibility for ESC planning, design, implementation, inspection, monitoring, maintenance, operation, and decommissioning.</p> <p>May delegate responsibilities to numerous design and construction professionals to construct/implement, maintain and inspect /monitor for the duration of the undertaking.</p> <p>Signs agreements, approvals permits and Authorizations to which compliance is legally binding.</p> <p>Ensure Contractors are aware of their responsibilities and are back charged for construction of ESC measures installed, maintained and specific restorations requirements.</p> <p>Appoint a Site Environmental Officer to confirm implementation and effectiveness of the ESCP.</p>
Contractor	<p>Erosion and Sediment Control Plans shall be prepared by the Contractor, approved by the Construction Supervisor, Site Manager and/or the NGC Environmental Specialist prior to construction and updated annually.</p> <p>The Contractor shall communicate erosion protection and sediment control information to all project staff and shall ensure a copy of the Erosion and Sediment Control Plan shall be made available at the project site.</p> <p>The Contractor shall be responsible for implementing and maintaining Erosion Protection and Sediment Control Plans and procedures.</p> <p>The Contractor shall be responsible for modifying erosion protection and sediment control installations to ensure continued effectiveness.</p> <p>The Contractor shall be responsible for installation and maintenance of erosion and sediment control measures</p> <p>Appoint a Environmental Representative to confirm that regulatory criteria are being met by the ESCP.</p>
Site Environmental Officer	<p>Conduct regular monitoring of ESC measures to confirm proper implementation and effectiveness of controls.</p> <p>Provide feedback to the Construction Contractor and the Licensing and Environmental Assessment Officer.</p> <p>Document site inspections and corrective actions.</p> <p>Maintain log books/ records.</p> <p>Conduct inspections of ESC measures to confirm that regulatory criteria are being met.</p> <p>Issue Environmental Improvement Orders, as required, if measures are not meeting regulatory criteria.</p>

Responsibilities for the development and implementation of an ESCP should be carried out in the order below:

- A contractor-specific Erosion Protection and Sediment Control Plan shall be prepared prior to starting construction.
- Erosion Protection and Sediment Control Plans shall be prepared by the Contractor, approved by the Resident Engineer/ Manager and the NGC Environmental Specialist prior to construction and updated annually.
- The Contractor shall communicate erosion protection and sediment control information to all project staff and a copy of the Erosion and Sediment Control Plan shall be made available at the project site.
- The Contractor shall be responsible for implementing and maintaining Erosion Protection and Sediment Control Plans and procedures.
- The Contractor shall be responsible for modifying erosion protection and sediment control installations to ensure continued effectiveness.
- The Site Environmental Officer shall conduct regular monitoring of erosion and sediment control measures to confirm implementation and continued effectiveness.
- The Site Environmental Officer shall make regular inspections of erosion protection and sediment control measures to confirm regulatory criteria are being met.
- The Site Environmental Officer shall make inspections of decommissioned project areas and sites in accordance with the project Rehabilitation and Vegetation Management Plan to ensure that rehabilitation measures are effective and that any deficiencies are addressed.

Erosion and Sediment Control Plan Components

The plan should include both temporary and permanent ESC's. Temporary ESC's are those that are in place during the construction phase, or a portion thereof, when exposed soils are vulnerable to increased erosion rates and streams are at risk of sedimentation. Permanent ESC's are those that are to be maintained throughout the operational phase of the Project.

General environmental protection components pertaining to erosion protection and sediment control are listed below.

1. Phase construction to limit soil exposure.
2. Minimize needless stripping and grading.
3. Stabilize exposed soils immediately.
4. Protect waterways and stabilize drainage ways.
5. Protect steep slopes and cuts.
6. Install perimeter controls.
7. Employ advanced sediment settling controls.
8. Ensure contractors are trained in ESC plan, implementation, inspections, maintenance and repairs.
9. Adjust ESC plan at construction site, as required.
10. Assess effectiveness of ESC control measures regularly and after storms, and repair, replace or upgrade, as required.
11. Respond to Environmental Improvement Orders related to erosion and sediment control, as required, if issued by Manitoba Hydro.

Monitoring and Inspection

Monitoring and Inspection is necessary to ensure the effectiveness of the plan. It provides confirmation of proper implementation and effectiveness of environmental protection measures, therefore contributing to the overall success of a project. Manitoba Hydro shall provide Site Environmental Officers prior to the start of an undertaking to document the pre-disturbance conditions, and to ensure that the erosion and sediment control plan is initiated at the start of the project. Additionally, post-construction monitoring is often required to ensure the restoration, stabilization, and required monitoring of constructed features/habitats is established. Manitoba Hydro shall provide Site Environmental Officers to conduct inspections of environmental components (soil and water) targeted for protection by erosion and sediment control measures in order to confirm that regulatory requirements are being achieved.

It is the duty of the contractor to ensure that the erosion and sediment control measures are properly installed, well maintained and functioning as intended on a daily basis. The ESCP should provide the framework for the inspection, maintenance including the need for repair, and record-keeping procedures during all stage of construction. The effectiveness of the ESCP depends directly on the frequency of monitoring and what actions are taken to address any failures that may occur. An effective construction monitoring program should include the following:

1. Construction drawings detailing the erosion and sediment controls installed which is updated through the construction period.
2. High risk areas should be identified on these drawings and routinely evaluated.
3. During inactive construction periods, where the site is left alone for 30 days or longer, a monthly monitoring should be conducted.
4. All damaged ESC measures should be repaired and/or replaced.
5. A monitoring schedule should be drawn up to include times, areas and person(s) responsible.

APPENDIX D – CONTRACTOR-DEVELOPED ENVIRONMENTAL PLANS

D.1 Emergency Preparedness and Response Plan

Attach Contractor developed Emergency Preparedness and Response Plan

D.2 Waste and Recycling Management Plan

Attach Contractor developed Waste and Recycling Management Plan

D.3 Erosion and Sediment Control Plan

Attach Contractor developed Erosion and Sediment Control Plan

D.4 Concrete Washout Management Plan

Attach Contractor developed Concrete Washout Management Plan

APPENDIX E – FISHERIES AND OCEANS CANADA OPERATIONAL STATEMENTS



ISOLATED OR DRY OPEN-CUT STREAM CROSSINGS

Fisheries and Oceans Canada
Manitoba Operational Statement

Version 1.0

For the purpose of this Operational Statement, the term “Isolated Crossing” means a temporary stream crossing technique that allows work (e.g., trenched pipeline or cable installation) to be carried out “in-the-dry” while diverting the natural flow around the site during construction. These types of open trenched crossings are isolated using flume or dam and pump techniques (see *Pipeline Associated Watercrossings*, 2005 at http://www.capp.ca/default.asp?V_DOC_ID=763&PubID=96717).

The term “Dry Open-cut Stream Crossing” means a temporary stream crossing work (e.g., trenched pipeline or cable installation) that is carried out during a period when the entire stream width is seasonally dry or is frozen to the bottom.

The risks to fish and fish habitat associated with isolated open cut stream crossings include the potential for direct damage to substrates, release of excessive sediments, loss of riparian habitat, stranding of fish in dewatered areas, impingement/entrainment of fish at pump intakes, and disruption of essential fish movement patterns. Similarly, dry open-cut stream crossings pose a risk to fish and fish habitat due to potential harmful alteration of substrates, loss of riparian habitat, and release of excessive sediment once stream flows resume.

The order of preference for carrying out a cable or pipeline stream crossing, in order to protect fish and fish habitat, is: a) punch or bore crossing (see *Punch & Bore Crossings* Operational Statement); b) high-pressure directional drill crossing (see *High-Pressure Directional Drilling* Operational Statement); c) dry open-cut crossing; and d) isolated open-cut crossing. This order must be balanced with practical considerations at the site.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your isolated or dry open-cut stream crossing project without a DFO review when you meet the following conditions:

- for dry, open-cut crossings the watercourse is dry or frozen completely to the bottom at the site,
- for isolated crossings, the channel width of the watercourse at the crossing site is less than 5 meters from ordinary high

water mark to ordinary high water mark (HWM) (see definition below),

- the isolated crossing does not involve the construction or use of an off-stream diversion channel, or the use of earthen dams,
- the isolated crossing ensures that all natural upstream flows are conveyed downstream during construction, with no change in quality or quantity,
- the site does not occur at a stream location involving known fish spawning habitat, particularly if it is dependent on groundwater upwelling,
- the use of explosives is not required to complete the crossing, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-cut Stream Crossing* listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial and federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (SARA) (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending the Manitoba Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-Cut Stream Crossing

1. Use existing trails, roads or cut lines wherever possible as access routes to avoid disturbance to the riparian vegetation.

2. Locate crossings at straight sections of the stream, perpendicular to the banks, whenever possible. Avoid crossing on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in the erosion and scouring of the stream bed.
3. Complete the crossing in a manner that minimizes the duration of instream work.
4. Construction should be avoided during unusually wet, rainy or winter thaw conditions.
5. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the utility right-of-way.
6. 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. Operational Statements are also available for *Ice Bridges and Snow Fills*, *Clear-Span Bridges*, and *Temporary Stream Crossing*.
 - 6.1. 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.
 - 6.2. Grading of the stream banks for the approaches should not occur.
 - 6.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
 - 6.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*).
 - 6.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
7. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks.
 - 7.1. Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit.
 - 7.2. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 7.3. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
 - 7.4. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
8. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.

9. Stabilize any waste materials removed from the work site, above the HWM, to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated Crossing

Temporary isolation is used to allow work “in-the-dry” while maintaining the natural downstream flow by installing dams up and downstream of the site and conveying all of the natural upstream flow into a flume, or pumping it around the isolated area. In addition to measures 1 to 10, the following measures should be carried out when conducting an isolated stream crossing:

11. Time isolated crossings to protect sensitive fish life stages by adhering to fisheries timing windows (see Measure 6.4).
12. Use dams made of non-earthen material, such as water-inflated portable dams, pea gravel bags, concrete blocks, steel or wood wall, clean rock, sheet pile or other appropriate designs, to separate the dewatered work site from flowing water.
 - 12.1. If granular material is used to build dams, use clean or washed material that is adequately sized (i.e., moderately sized rock and not sand or gravel) to withstand anticipated flows during the construction. If necessary, line the outside face of dams with heavy poly-plastic to make them impermeable to water. Material to build these dams should not be taken from below the HWM of any water body.
 - 12.2. Design dams to accommodate any expected high flows of the watercourse during the construction period.
13. Before dewatering, rescue any fish from within the isolated area and return them safely immediately downstream of the worksite.
 - 13.1. You will require a permit from DFO to relocate any aquatic species that are listed as either endangered or threatened under SARA. Please contact the DFO office in your area to determine if an aquatic species at risk is in the vicinity of your project and, if appropriate, use the DFO website at www.dfo-mpo.gc.ca/species-especes/permits/sarapermits_e.asp to apply for a permit.



OVERHEAD LINE CONSTRUCTION

Fisheries and Oceans Canada Manitoba Operational Statement

Version 3.0

Overhead lines are constructed for electrical or telecommunication transmission across many watercourses that range in size from small streams and ponds to large rivers, lakes and reservoirs. This Operational Statement applies to selective removal of vegetation along the right-of-way to provide for installation and safe operation of overhead lines, and passage of equipment and materials across the water body.

Although fish habitat occurs throughout a water system, it is the riparian habitat that is most sensitive to overhead line construction. Riparian vegetation occurs adjacent to the watercourse and directly contributes to fish habitat by providing shade, cover, and spawning and food production areas. It is important to design and build your overhead line project to meet your needs while also protecting riparian areas. Potential impacts to fish and fish habitat include excessive loss of riparian vegetation, erosion and sedimentation resulting from bank disturbance and loss of plant root systems, rutting and compaction of stream substrate at crossing sites, and disruption of sensitive fish life stages.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your overhead line project without a DFO review when you meet the following conditions:

- it does not require the construction or placement of any temporary or permanent structures (e.g. islands, poles, crib works, etc.) below the ordinary high water mark (HWM) (see definition below), and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out

in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Manitoba Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines

1. Installing overhead lines under frozen conditions is preferable in all situations. On wet terrains (e.g., bogs), lines should be installed under frozen conditions, where possible, or using aerial methods (i.e., helicopter).
2. Design and construct approaches so that they are perpendicular to the watercourse wherever possible to minimize loss or disturbance to riparian vegetation.
3. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or overhead line structures.
 - 3.1. Wherever possible, locate all temporary or permanent structures, such as poles, sufficiently above the HWM to prevent erosion.
4. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to accommodate the overhead line. This removal should be kept to a minimum and within the road or utility right-of-way.
5. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing Operational Statement* is also available.
 - 5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads)

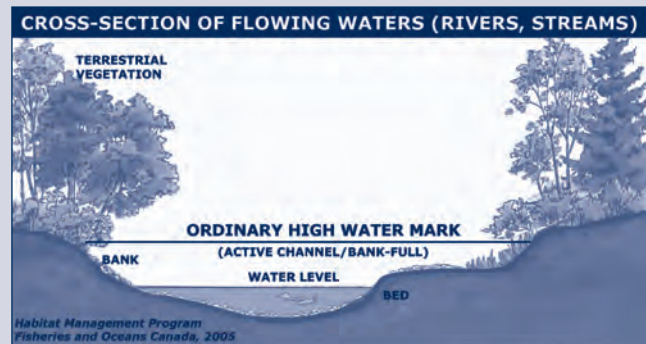
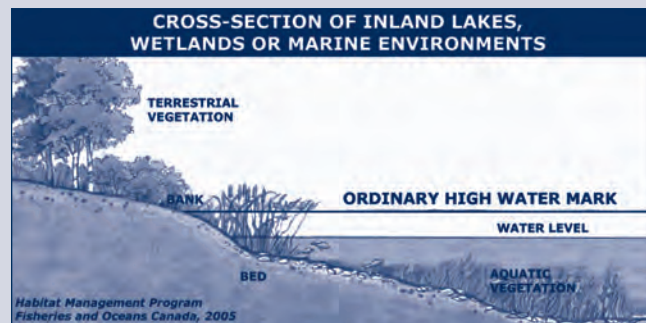
should be used provided they do not constrict flows or block fish passage.

- 5.2. Grading of the stream banks for the approaches should not occur.
 - 5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
 - 5.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*).
 - 5.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
6. Operate machinery on land and in a manner that minimizes disturbance to the banks of the watercourse.
 - 6.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 6.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
 - 6.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
 - 6.4. Restore banks to original condition if any disturbance occurs.
 7. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
 - 7.1. Avoid work during wet, rainy conditions or use alternative techniques such as aerial methods (i.e., helicopter) to install overhead lines.
 8. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
 9. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 9.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark (HWM) – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active

channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).



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Aussi disponible en français

http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp

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TEMPORARY STREAM CROSSING

Fisheries and Oceans Canada
Manitoba Operational Statement

Version 1.0

A temporary stream crossing consists of i) a one-time ford in flowing waters, ii) a seasonally dry streambed ford, or iii) a temporary bridge (e.g., Bailey bridge or log stringer bridge). Temporary stream crossings are employed for short term access across a watercourse by construction vehicles when an existing crossing is not available or practical to use. They are not intended for prolonged use (e.g., forest or mining haul roads). The use of temporary bridges or dry fording is preferred over fording in flowing waters due to the reduced risk of damaging the bed and banks of the watercourse and downstream sedimentation caused by vehicles. Separate Operational Statements are available for *Ice Bridges* and *Snow Fills* used for temporary access during the winter and for non-temporary *Clear Span Bridges*.

The risks to fish and fish habitat associated with temporary stream crossings include the potential for direct harm to stream banks and beds, release of excessive sediments and other deleterious substances (e.g., fuel, oil leaks), loss of riparian habitat and disruption to sensitive fish life stages.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your temporary stream crossing project without a DFO review when you meet the following conditions:

- the bridge is no greater than one lane in width, and no part of its structure is placed within the wetted portion of the stream,
- the work does not include realigning the watercourse,
- for fording in flowing waters and temporary bridges, the channel width at the crossing site is no greater than 5 metres from ordinary high water mark to ordinary high water mark (HWM) (see definition below),
- disturbance to riparian vegetation is minimized,
- the work does not involve dredging, infilling, grading or excavating the bed or bank of the watercourse,
- all crossing materials will be removed prior to the spring freshet, or immediately following project completion if this occurs earlier,

- fording involves a one time event (over and back) and will not occur in areas that are known fish spawning sites,
- the crossing will not result in erosion and sedimentation of the stream, or alteration (e.g., compaction or rutting) of the bed and bank substrates,
- the crossing does not involve installation of a temporary culvert, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Carrying Out a Temporary Stream Crossing* listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial and federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (SARA) (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending the Manitoba Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Carrying Out a Temporary Stream Crossing

1. Use existing trails, roads or cut lines wherever possible, as access routes to avoid disturbance to the riparian vegetation.
2. Locate crossings at straight sections of the stream, perpendicular to the bank, whenever possible. Avoid crossing on meander bends, braided streams, alluvial

fans, or any other area that is inherently unstable and may result in the erosion and scouring of the stream bed.

3. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the road or utility right-of-way. When practicable, prune or top the vegetation instead of uprooting.
4. Generally, there are no restrictions on timing for the construction of bridge structures or fording seasonally dry streambeds, as they do not involve in-water work. However, if there are any activities with the potential to disrupt sensitive fish life stages (e.g., fording of the watercourse by machinery) these should adhere to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*).
5. 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.
 - 5.1. 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.
 - 5.2. Grading of the stream banks for the approaches should not occur.
 - 5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary bridge should be used in order to protect these areas.
 - 5.4. The one-time fording should adhere to fisheries timing windows (see Measure 4).
 - 5.5. Fording should occur under low flow conditions, and not when flows are elevated due to local rain events or seasonal flooding.
6. Install effective sediment and erosion control measures before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
7. For temporary bridges also employ the following measures:
 - 7.1. Use only clean materials (e.g., rock or coarse gravel fill, wood, or steel) for approaches to the bridge (i.e., not sand, clay or organic soil) and install in a manner that avoids erosion and sedimentation.
 - 7.2. Design temporary bridges to accommodate any expected high flows of the watercourse during the construction period.
 - 7.3. Restore the bank and substrate to pre-construction condition.
 - 7.4. Completely remove all materials used in the construction of the temporary bridge from the watercourse following the equipment crossing, and stabilize and re-vegetate the banks.

8. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks.

- 8.1. Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit.
 - 8.2. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 8.3. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
 - 8.4. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
9. Stabilize any waste materials removed from the work site, above the HWM, to prevent them from entering any watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with preferably native grass or shrubs.
 10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark (HWM) - The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the "active channel/bank-full level" which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

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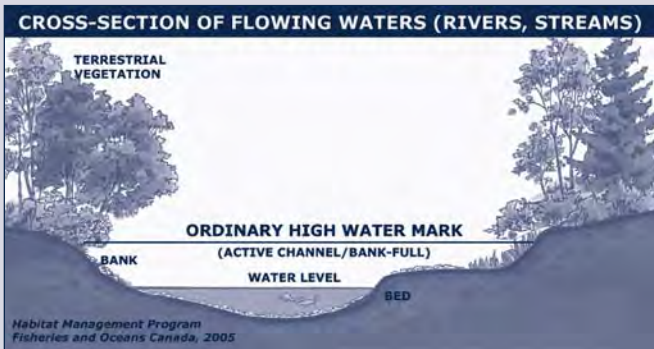
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Aussi disponible en français

http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp



APPENDIX F – MANITOBA HYDRO EMERGENCY RESPONSE PLAN – RIEL CONVERTER STATION