

8.0 ENVIRONMENTAL PROTECTION MONITORING AND FOLLOW-UP

8.1 INTRODUCTION

Mitigation measures, monitoring and other follow-up actions identified in Chapter 7 (Environmental Effects Assessment and Mitigation) of the Project Environmental Assessment (EA) Report will be implemented through an Environmental Protection Program. Manitoba Hydro's Environmental Protection Program provides the framework for implementing, managing, monitoring and evaluating environmental protection measures consistent with regulatory requirements, corporate commitments, best practices and public expectations. Environmental protection, management and monitoring plans will be prepared and implemented under the environmental protection framework to address environmental protection requirements in a responsible manner. Socio-economic elements will be encompassed within environmental protection programs.

The purpose of this Environmental Protection Program (the Program) chapter is to outline how Manitoba Hydro will implement, manage and report on environmental protection measures, monitoring and other follow-up actions as well as regulatory and policy requirements and other commitments identified in the Project EA Report. The Draft Environmental Protection Plan (EnvPP) for the Project will be provided as a separate document in support of the EA Report submission.

The Environmental Protection Program was developed in accordance with Manitoba Hydro's vision, goals and environmental policies.

The Corporate Vision is:

"To be the best utility in North America with respect to safety, rates, reliability, customer satisfaction, and environmental leadership, and to always be considerate of the needs of customers, employees, and stakeholders". (Manitoba Hydro 2012)

One of the corporation's goals is *"To protect the environment in everything we do"*. This goal can only be achieved with the full commitment of Manitoba Hydro management, employees, consultants and contractors at all project stages from planning and design through the construction and operational phases. Manitoba Hydro's Corporate Environmental Management Policy (Manitoba Hydro 2012) states that:

“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.”*

8.2 ENVIRONMENTAL PROTECTION PROGRAM

8.2.1 Overview

Manitoba Hydro’s Environmental Protection Program provides the framework for the delivery, management and monitoring of environmental and socio-economic protection measures that satisfy corporate policies and commitments, regulatory requirements, environmental protection guidelines and best practices, and input from stakeholders and the Aboriginal community. The Program describes how Manitoba Hydro is organized and functions to deliver timely, effective, and comprehensive solutions and mitigation measures to address potential environmental effects. Roles and responsibilities for Manitoba Hydro employees and contractors are defined, and management, communication and reporting structures are outlined. The Environmental Protection Program includes the what, where and how aspects of protecting the environment during the pre-construction, construction, operation and decommissioning of the Project.

8.2.2 Organization

The organizational structure of the Environmental Protection Program includes senior Manitoba Hydro management, and project management and implementation teams that work together to ensure timely and effective implementation of environmental protection measures identified in environmental protection plans and is broadly depicted in Figure 8-1. Manitoba Hydro senior management is responsible for the overall Environmental Protection

Program including resourcing, management and performance, and is accountable for regulatory compliance, policy adherence and stakeholder satisfaction.

The Environmental Protection Management Team is composed of senior Manitoba Hydro staff and is responsible for the management of environmental protection plans including compliance with regulatory and other requirements, quality assurance and control, and consultation with regulators, stakeholders and aboriginal communities. The management team is supported by environmental consultants and advisors.

The Environmental Protection Implementation Team is composed of Manitoba Hydro operational field and office staff, and is responsible for the day-to-day implementation of environmental protection plans including monitoring, inspecting and reporting. The implementation team works closely with other Manitoba Hydro staff on an as-required basis.

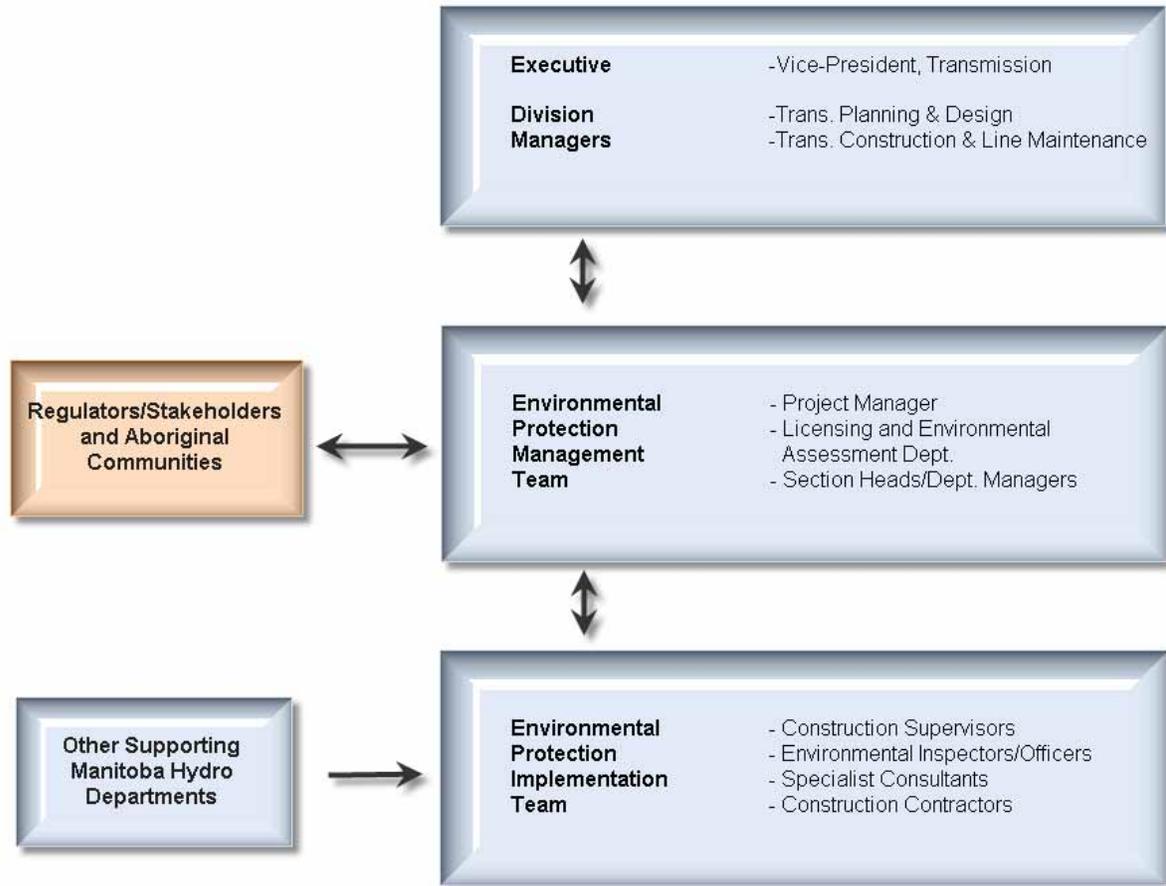


Figure 8-1: Environmental Protection Organizational Structure

8.2.3 Roles and Responsibilities

Roles and responsibilities for delivery of the Project and implementation of environmental protection measures are illustrated in general terms in Figure 8-2.

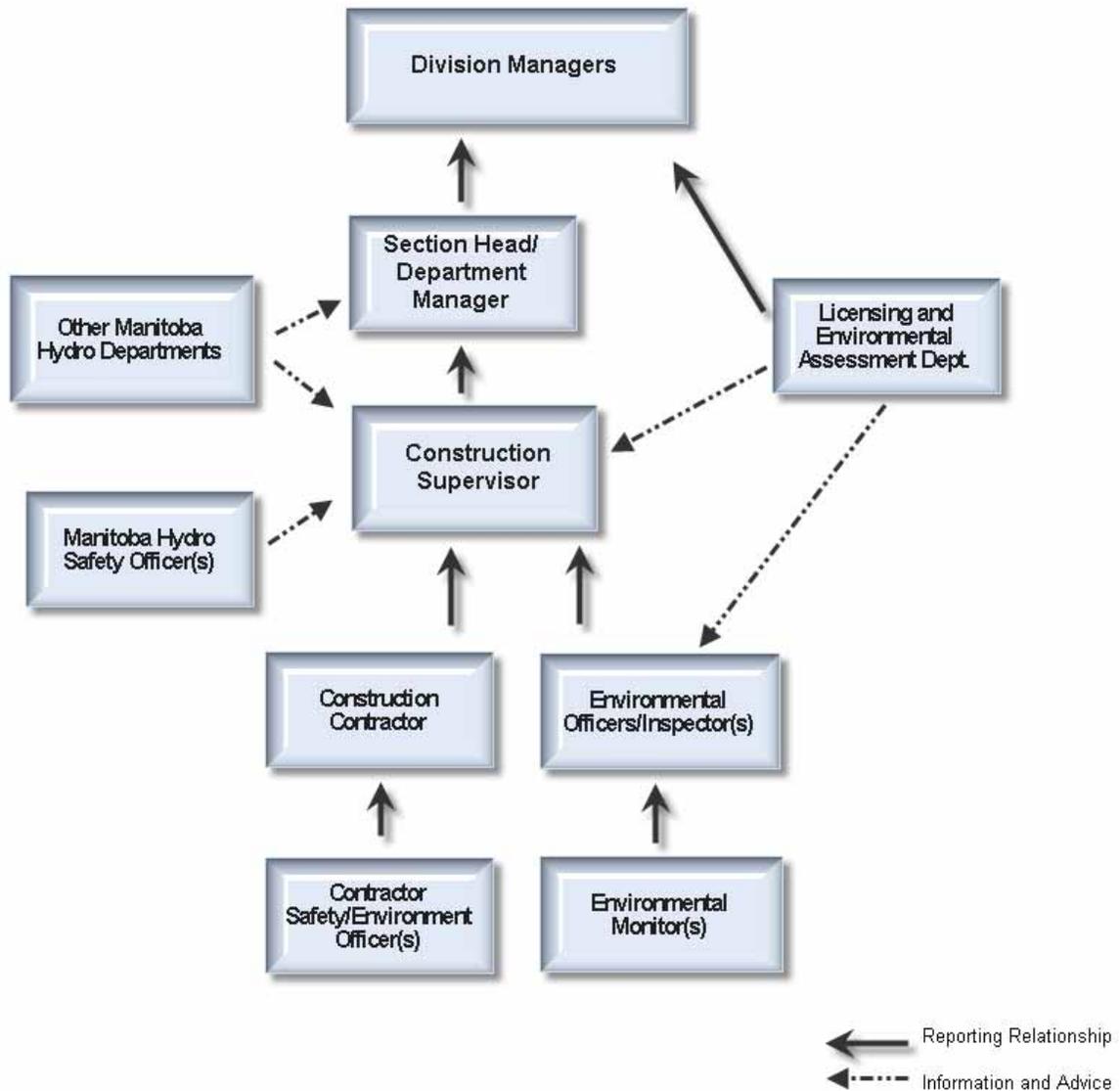


Figure 8-2: Typical Organizational Lines of Reporting and Communication

- The Construction Supervisor has overall responsibility for the implementation of the environmental protection plans and reports to a Section Head or Department Manager.

Construction Supervisors are also responsible for Regulator/Stakeholder/First Nations and Metis engagement during construction.

- The Licensing and Environmental Assessment Department oversees the development of environmental protection documents and associated inspection and monitoring programs. Licensing and Environmental Assessment is responsible for Regulator/Stakeholder/First Nations and Metis engagement in the development of said documents and programs.
- The Construction Contractor is responsible for ensuring work adheres to the environmental protection plans and reports to the Construction Supervisor.
- Environmental Officers/Inspectors have the primary responsibility to confirm that environmental protection measures and specifications are implemented as per the environmental protection plans as well as provide information and advice to Construction Supervisor.
- Environmental Monitors assist Environmental Officers/Inspectors and perform biophysical monitoring.
- Manitoba Hydro Field Safety, Health and Emergency Response Officers are responsible for the development and execution of the safety program and Occupational Health and Safety practices at the various construction sites.

Other Manitoba Hydro employees including engineers and technicians provide information and advice to the Construction Supervisor.

8.2.4 Resources

Allocating adequate resources to the environmental aspects of project planning, development, implementation and operation is key to successful implementation of environmental protection measures and follow-up including monitoring and other requirements. Manitoba Hydro commits resources early in the planning cycle to ensure effective environmental assessment, mitigation and monitoring. During the Selection and Environmental Assessment (SSEA) process teams of engineers and environmental professionals develop preventative or avoidance mitigation measures that include design, routing and siting alternatives. In addition, there are resource allocations for the delivery and implementation of specific environmental protection measures to meet corporate policy and government regulatory requirements. Manitoba Hydro is committed to staffing the Environmental Protection Program with sufficient Environmental Inspectors and providing required support including training, financial resources and equipment.

8.2.5 Environmental Management

Manitoba Hydro is certified under the ISO 14001 Environmental Management System standard and is subject to requirements of the standard including annual audits to verify its environmental performance. An Environmental Management System is a framework for developing and applying its environmental policy and includes articulation of organizational structure, responsibilities, practices, processes and resources at all levels of the corporation. The Environmental Management System includes commitments to comply with legislation, licenses, permits and guidelines, conduct inspections and monitoring, and review the results for adherence to requirements. The ISO standard ensures quality, performance and continual improvement in the delivery of Manitoba Hydro's Environmental Protection Program.

8.2.6 Environmental Protection Documents

Several environmental protection planning documents will be developed for different project phases, components and activities. The documents will include environmental protection, management and monitoring plans. The level of detail captured in the various plans will increase as the project advances through planning, design, construction and operation phases, and the environmental assessment and licensing process (Figure 8-3).

The Draft Environmental Protection Plan will be developed for review and consideration during the regulatory process and will be finalized once the licence terms and conditions, and other regulatory requirements are known. This final Environmental Protection Plan will provide the framework under which detailed Construction and Operational Phase Environmental Protection Plans, along with various Management and Monitoring Plans that include socio-economic considerations, will be developed.

Prior to the commencement of construction activities, Construction Phase Environmental Protection Plans will be prepared. It is anticipated that several environmental protection plans will be prepared, each addressing separate project components or construction contracts. The Construction Phase Environmental Protection Plans will provide a high level of detail required to implement the general and specific environmental protection measures and will cover the construction period from beginning to end.

Operation Phase Environmental Protection Plans will be prepared prior to completion of the Project. One or more environmental protection plans will be prepared for this phase of the Project, each addressing separate project components. Operation Phase Environmental Protection Plans will cover the period from commissioning to the eventual decommissioning of the Project. A Decommissioning Phase Environmental Protection Plan would be prepared prior to the eventual decommissioning of the Project.

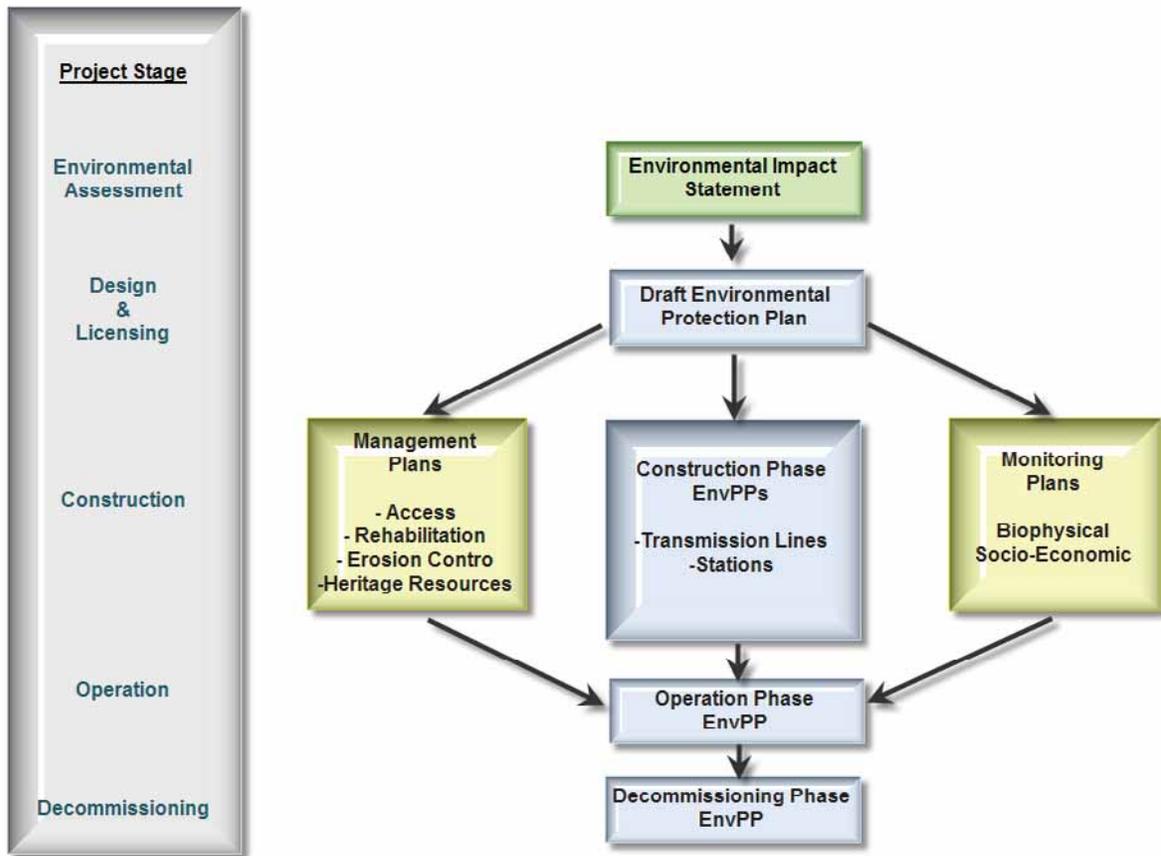


Figure 8-3: Typical Environmental Protection Documents

Management plans are prepared in response to specific environmental issues identified during the environmental assessment of the Project. Typical environmental issues include road access, erosion control and heritage resources. Management plans are structured documents that provide reasoned and approved courses of action to address environmental issues. Management plans are also prepared in response to regulatory requirements and responsible management practices.

Monitoring plans are prepared in response to specific follow-up requirements identified during the environmental assessment of the Project. Follow-up requirements include those actions implemented to confirm compliance with regulatory requirements and to assess the effectiveness of the environmental assessment. Example follow-up actions include invasive

vegetation, water quality, population size, breeding bird nest site abundance and resource use.

8.2.7 Pre-construction Activities

Manitoba Hydro will undertake a number of activities prior to commencing construction of the Project to set the direction for environmental protection and compliance with legislated requirements. Manitoba Hydro will meet with First Nations and Metis, in the development of Construction Phase Environmental Protection Plans to ensure concerns with cultural and environmentally sensitive sites identified in the aboriginal traditional knowledge workshops and reports are addressed and mitigated to the extent possible.

Manitoba Hydro will obtain all licenses, permits, authorizations and other approvals including property agreements, rights-of-way easements and releases prior to commencement of construction of each individual project component or segment. Any additional terms and conditions of these approvals will be incorporated into the Construction Phase Environmental Protection Plan. Any additional approval requirements to be obtained by the Contractors will be identified and communicated to the successful bidders. Pre-construction contacts will be established with provincial and federal regulatory authorities including Manitoba Conservation, Manitoba Water Stewardship, Department of Fisheries and Oceans, Transport Canada and others, and formal points of contact will be identified.

Licensing and Environmental Assessment Department will typically participate in the tender/direct negotiated contract (DNC) development process to ensure environmental requirements will be included as contract specifications. All bidders will be required to list and defend their environmental record and must have an environmental policy including a commitment to environmental protection.

Meetings will be held with the successful contractors to review the environmental protection requirements, establish roles and responsibilities, management, monitoring and other plans, inspection and reporting requirements, and other submittals. Prior to the start of construction, contractor employees will be trained and/or oriented on environmental protection requirements. Manitoba Hydro and contract employees, project managers, consultants and others working on the proposed Project will be required to attend orientation sessions.

8.2.8 Construction Activities

A number of activities occur during construction of the Project to implement environmental protection measures and facilitating compliance with regulatory requirements. Such activities

include meetings with contractors, working with regulators, inspection and compliance, work stoppage and emergency response.

The Project Manager, Construction Supervisor, Environmental Officer/Inspector and Licensing and Environmental Assessment staff will meet with regulatory authority points of contact at the beginning of the Project to outline construction plans and schedules, and will request regular meetings to provide updates on project progress, environmental protection measure implementation and regulatory compliance. Manitoba Hydro will fulfill all regulatory requirements for submission of inspection, monitoring and other reports. Regulators will be notified immediately in case of emergencies situations, environmental accidents or other incidents in accordance with regulatory requirements. Any proposed changes or alterations to construction of the Project, environmental protection measures or monitoring activities will be reviewed with the appropriate regulatory authorities and may be subject to regulatory and/or possible amendments to licence.

Manitoba Hydro will establish a comprehensive integrated environmental inspection program to comply with regulatory requirements, implement environmental protection measures and meet corporate environmental objectives.

8.2.9 Work Stoppage

The duty to stop work will rest with everyone encountering situations where the environment, including biophysical, socio-economic and heritage resources, are threatened by an activity or occurrence that has not been previously identified, assessed and mitigated. Work stoppage will also occur in the event of an environmental accident, extreme weather event or exposed human remains. Individuals discovering such situations will inform their supervisor who will report the matter to the Construction Supervisor immediately who will issue a stop work order. The Contractor will also be required to stop work voluntarily where construction activities are adversely affecting the environment or where mitigation measures are not effective in controlling environmental effects. Remedial action plans or other environmental protection measures will be developed and implemented immediately after discussion and prior to resumption of work if previously halted. Work would not resume until the situation has been assessed and responded to and the Construction Supervisor approves the resumption of work. All environmental stop work orders will be documented, reported to regulatory authorities (if applicable) and reviewed at construction meetings.

8.2.10 Emergency and Contingency Response

Spills of hazardous substances, fires and explosions, environmental accidents, heritage resource discoveries and other emergency or contingency situations will require immediate

action and response in accordance with established response plans. Provincial, federal and municipal authorities, and Manitoba Hydro personnel will be notified in accordance with regulations and emergency and contingency response plans. These plans will provide names of emergency responders, up to date contact information and notification procedures. Contractors will also be required to have emergency response plans outlining contacts and response measures to exigent situations including hazardous materials spills, heritage resource discoveries, environmental accidents and fires or explosions. Manitoba Hydro has emergency response coordinators to deal with spills of hazardous and other substances.

8.2.11 Tools and Resources

An Environmental Protection Information Management System (EPIMS) will be developed as a central repository of environmental protection information including but not limited to:

- Environmental protection documents;
- Reference information such as regulations, guidelines;
- Daily, weekly and monthly inspection reports;
- Environmental incident reports;
- Monitoring program field data and reports.

The environmental inspection program will also employ modern electronic recording, reporting and communication systems using field computers, geographic positioning systems and digital cameras. Electronic forms will be transferable to supervisors and project managers thereby enabling rapid communication and response to emerging situations. Field computers will have project and other reference information needed for effective implementation of environmental protection measures including regulations, guidelines, licences, permits, engineering drawings, specifications, maps, reports and data.

The Environmental Protection Information Management System will also monitor and report on environmental protection implementation, regulatory compliance and incident reporting. EPIMS will be the mechanism to provide reporting and tracking of environmental protection performance, and be the foundation of an auditable environmental protection program.

8.2.12 Communications

Manitoba Hydro personnel will maintain ongoing communications with Manitoba Conservation, other provincial and federal departments, and Aboriginal communities as necessary regarding implementation of environmental protection plans. The Construction Supervisor and Environmental Officers/Inspectors will maintain ongoing communications with the Contractor and contract staff through daily tailboard meetings and weekly or otherwise scheduled construction meetings at the worksite. Daily, weekly and monthly inspection reports as well as incident, monitoring and other reports will be prepared and available on site for the regulators, contractors and Manitoba Hydro staff. In addition, Manitoba Hydro will prepare summary information and activity reports related to environmental protection for the proposed Project on an annual basis. These reports will be designed for a general readership and will provide opportunities for interested parties to provide feedback on the Project as it is constructed and eventually operated. Manitoba Hydro will provide Aboriginal communities and the public with on-going opportunities to review and comment on the Project as it is being developed. A dedicated Project website fed with information from the EPIMS will be developed to facilitate communication with the public. All enquiries or complaints received will be recorded and reviewed by the Environmental Protection Management Team for response or action.

8.3 ENVIRONMENTAL PROTECTION PLAN

8.3.1 Overview

The Environmental Protection Plan (EnvPP) is the main implementation instrument under the Environmental Protection Program. The draft EnvPP will be submitted to Manitoba Conservation following the submission of the Environmental Assessment Report. It will be provided as a draft to allow for review and input from the regulatory process before finalization which will occur subsequent to licensing and prior to construction.

EnvPPs will document environmental protection measures to provide for compliance with regulatory and other requirements, and to achieve environmental protection goals consistent with corporate environmental policies. Manitoba Hydro's environmental protection plans will be designed as "user-friendly" reference documents that will provide project managers, construction supervisors and contractors with detailed lists of environmental protection measures and other requirements to be implemented in the design, construction and operation phases of a project. Environmental protection measures will be organized by construction component and activity, and environmental component and issue to assist project personnel in implementing measures for specific work sites and activities.

The Draft EnvPP will be a key element in implementing effective environmental protection and minimizing the potential adverse environmental effects identified in the EA Report. It will also outline action to identify unforeseen environmental effects and to implement adaptive management strategies to address them. An important component of an EnvPP is monitoring and updating which will serve to ensure that environmental protection measures remain current and will provide for continual improvement of environmental performance.

8.3.2 General Environmental Protection Measures

General environmental protection measures (Appendix F) for the Project will include mitigation measures and follow-up actions identified in the Environmental Assessment Report including: design mitigation, provincial and federal regulatory requirements, best practice guidelines, Manitoba Hydro environmental policies and commitments, and input from stakeholders, Aboriginal communities and the general public. The general environmental protection measures will be listed for all major components and activities associated with the Project. Project components include transmission lines, access roads, construction camps, marshalling yards, a switching station and a construction power station. Project activities may include blasting, burning, clearing, draining, drilling, etc. General management measures will also be provided that relate to all environmental protection categories.

8.3.3 Specific Environmental Protection Measures

Specific environmental protection measures will be provided for environmentally sensitive sites. Environmentally sensitive sites are locations, features, areas, activities or facilities along or immediately adjacent to the transmission line right of way and other project components that are determined to be ecologically, socially, economically or culturally important and sensitive to disturbance by the Project and, as a result, require site-specific mitigation measures. The sites may include sensitive or unique terrain features, waterbodies and wetlands, important mammal, bird, and amphibian habitats, protected species and areas, and heritage resources.

Through Aboriginal Traditional Knowledge workshops and self-directed aboriginal community reports, some culturally, and environmentally sensitive sites were identified. Manitoba Hydro will be working with aboriginal communities prior to the start of construction to further identify and map these sites and develop mitigation measures to minimize the effects of the project on them.

For the Construction and Operation Phase Environmental Protection Plans, orthophoto map sheets will provide Manitoba Hydro project managers, construction supervisors and

employees, and contractors and contract employees detailed site-specific environmental protection information that can be implemented, managed, evaluated and reported on in the field. The orthophoto map sheets will be provided in paper and electronic formats which will be used by Manitoba Hydro, contractor and regulatory staff on laptop computers in field offices, vehicles and aircraft.

8.3.4 Follow-up Activities

Follow-up is an activity that will be carried out to verify the accuracy of the environmental assessment of a project, assess the effectiveness of measures taken to mitigate adverse effects and determine compliance with regulatory requirements. Follow-up identified in Chapter 7, Effects Assessment and Mitigation, will be implemented through inspection, monitoring, management and auditing actions.

8.3.4.1 Inspection

Inspection is defined as the organized and routine examination or evaluation, including observations, measurements and sometimes tests, of a construction project or activity. Inspection results will be compared to predefined requirements or standards to determine whether an activity conforms to these requirements. Inspection will provide an essential function in environmental protection and implementation of mitigation measures. Much of the success in environmental protection will be attributable to how well environmental inspection is carried out during the construction phase of the Project.

Manitoba Hydro is establishing a comprehensive and integrated environmental inspection program to facilitate effective implementation of environmental protection measures, compliance with regulatory approvals and fulfilment of corporate environmental objectives. The inspection program will include hiring and training of Environmental Inspectors to be on-site during all construction activities. Trained inspectors will visit work sites daily and inspect for compliance with license terms and conditions, and adherence to environmental protection measures. Inspection activities will be recorded in journals and daily inspection forms that will be submitted to the Construction Supervisor. Weekly and monthly summary reports will also be submitted to the Manitoba Hydro Project Manager and senior management as required or requested.

8.3.4.2 Monitoring

Monitoring is the continuing observation, measurement or assessment of environmental conditions at and surrounding a construction project or activity. Two main types of monitoring are typically undertaken for environmental assessments: 1) environmental monitoring to verify the accuracy of the predictions made and the effectiveness of the

mitigation measures implemented; and 2) compliance monitoring to verify whether a practice or procedure meets legislated requirements. Monitoring determines if environmental effects occur as predicted, residual effects remain within acceptable limits, regulatory limits, criteria or objectives are not exceeded and mitigation measures are as effective as predicted. Monitoring also allows for adaptive management where monitoring results show there is a need for additional environmental protection or enhancement.

Monitoring plans will describe parameters to be monitored, methods to be used, roles and responsibilities, and reporting schedules. Monitoring will be carried out by Manitoba Hydro and may be contracted to environmental consultants that possess the necessary expertise, equipment and analytical facilities. Monitoring plans and reports from monitoring programs will be submitted to regulatory authorities, Aboriginal communities and placed on the project website for the Project.

Environmental monitoring plans for the Project will be prepared to address follow-up actions identified in the EA Report as well as specific environmental protection, best practice and regulatory requirements, including the following plans:

- Biophysical Monitoring Plan
- Socio-economic Monitoring Plan

Biophysical Monitoring

Potential biophysical environmental effects have been identified through the environmental assessment of the Project. To illustrate how Manitoba Hydro is going to monitor the mitigation prescribed to minimize the potential effects of the project, a Biophysical Environmental Effects Monitoring Framework (Appendix G) has been developed. The framework outlines the environmental effects that need to be addressed and monitored, how the Biophysical Environmental Effects Monitoring Plan will be developed, and the process in which the results of the monitoring plan will be shared with regulators, stakeholders, Aboriginal communities and the public.

Socio-economic Monitoring

Monitoring key components of the socio-economic environment will be undertaken during the construction and operation and maintenance phases of the proposed Project. Manitoba Hydro has experience undertaking such activities and has gained valuable insight through recent developments (e.g., Wuskwatim Generation Station and Transmission projects). Similar to other projects undertaken by Manitoba Hydro, socio-economic monitoring plans will be developed and submitted to the regulator in advance of all project phases. All results from the Socio-economic Monitoring Program will be reported to regulatory authorities

annually. Two streams of socio-economic monitoring will be undertaken for the Project – economic monitoring and social monitoring.

The purposes of the Socio-economic Monitoring Program for the Project will be to:

- Confirm effects predictions documented in the Environmental Assessment report;
- Monitor the effectiveness of mitigation measures;
- Identify unanticipated effects;
- Identify other actions necessary to mitigate adverse effects or enhance positive effects;
and
- Provide socio-economic information for future projects.

8.3.4.3 Management

Management is the control of pre-defined environmental effects, issues and concerns through the implementation of reasoned and approved courses of action. Management plans will be prepared to address important management issues, regulatory requirements and corporate commitments identified in the Project EA Report. The management plans will describe the management actions, roles and responsibilities, evaluation mechanisms, updating requirements and reporting schedules. The following management plans will be prepared prior to the construction of the Project:

- Access Management Plan;
- Vegetation Management Plan;
- Rehabilitation Plan;
- Heritage Resources Protection Plan;
- Erosion Protection and Sediment Control Plan;
- Emergency Preparedness and Response Plan; and
- Solid Waste/Recycling Management Plan.

8.3.5 Review and Updating

Construction Phase Environmental Protection Plans will be reviewed annually or at the end of each construction season. Reviews will be conducted by Manitoba Hydro personnel in consultation with the Contractor, and regulators. Checklists will be used to confirm that reviews address all required information in a consistent manner. The results of each review will be summarized in a report that documents the issues addressed and provides recommended updates to the environmental protection plan.