

## 6.0 ASSESSMENT APPROACH

### 6.1 Introduction

This chapter describes the approach taken to evaluate the potential effects associated with the Project.

The main objectives of the environmental assessment of the Project were to:

- ◆ Assist in the planning and design of the Project by identifying and assessing potential environmental effects and **mitigation** options to avoid or minimize **adverse effects** and maximize positive effects to the degree practicable;
- ◆ Address concerns and issues identified by Aboriginal peoples, local residents, and other stakeholders with respect to the Project; and
- ◆ Provide sufficient information to prepare an Environmental Impact Statement for consideration by regulators in exercising their legislated mandate.

The approach embraced the following principles:

- ◆ An understanding is required of the existing physical, biological, and socio-economic environments in the study area;
- ◆ An understanding is required of the Project and the potential interactions between the Project and the environment;
- ◆ **Aboriginal knowledge**, local knowledge, and scientific analysis may all contribute to gaining an understanding of the existing environment and how the existing environment may be affected by the Project;
- ◆ An understanding is required of how other past and potential future human activities have and continue to affect the environment and how these activities may interact with the Project;
- ◆ Project effects need to be viewed from the perspective of different stakeholders;
- ◆ Stakeholder perspectives will be sought through consultation;
- ◆ Adverse effects will be avoided, mitigated or compensated for and positive effects will be maximized to the extent practicable; and
- ◆ **Follow-up** monitoring will be required.

The main guidance documents considered included the:

- ◆ Manitoba Hydro Pointe du Bois Spillway Replacement Project Environmental Assessment Scoping Document (August 2010);
- ◆ Manitoba Conservation Information Bulletin Environment Act Proposal Report Guidelines (March 2009);

- ◆ CEEA Reference Guide: Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects;
- ◆ CEEA Reference Guide: Assessing Cumulative Environmental Effects (November 1994);
- ◆ CEEA **Cumulative Effects Assessment** Practitioners Guide (Hegmann et al. 1999); and
- ◆ CEEA Operational Policy Statement: Addressing Cumulative Environmental Effects under the *Canadian Environmental Assessment Act* (March 1999).

## 6.2 Overview of Assessment Approach

The effects assessment approach included the following steps:

- ◆ Describe works and activities associated with the Project;
- ◆ Establish spatial (study areas) and temporal boundaries relevant to the Project;
- ◆ Identify potential issues through studies and consultations with interested parties;
- ◆ Identify and describe environmental components;
- ◆ Identify the interaction between the Project and the environment;
- ◆ Identify Valued Environmental Components (VECs);
- ◆ Identify mitigation measures for potential adverse effects and/or to enhance positive effects;
- ◆ Determine the **significance** of any residual adverse effects of the Project; and
- ◆ Identify potential cumulative effects.

## 6.3 Works and Activities

A full Project Description was developed to describe the Project works and activities. The Project Description is contained in Chapter 3.0 of this EIS.

## 6.4 Spatial Boundaries

Study area boundaries for biological and socio-economic studies and information gathering, and thus the spatial boundaries for the assessment, were initially associated with the rebuild alternative (Chapter 2.0) and determined in 2007. The boundaries defined the **geographic extent** for potential environmental effects associated with the construction and operation of the rebuild alternative. The potential effects were associated with the physical works or extent of changes to water level and/or flows. The physical and biological study area encompassed the Winnipeg River area from Lamprey

Rapids to Slave Falls. Studies for the physical, aquatic and **terrestrial** components of the environment were carried out within this study area. The socio-economic study area encompassed a wider regional area to capture the regional effects of the Project related to transportation, material source areas, resource use and tourism, and economic opportunities.

Following the decision to proceed with the spillway replacement rather than the rebuild alternative, the biological study area remained unchanged; however, the socio-economic study area was adjusted to reflect the smaller scope of the spillway replacement project. The adjusted socio-economic study area runs west to Lake Winnipeg, north to Sagkeeng First Nation, south to Seddons Corner and east into Ontario. Further terrestrial studies related to rare plants and heritage resource investigations were undertaken to focus on the footprint of the spillway replacement project. Information gathered for the socio-economic component related to the rebuild alternative was adjusted to the smaller area related to the spillway replacement project.

A further description of the spatial boundaries for the assessment, including Figures, is contained in Chapter 7.0 of this EIS.

## **6.5 Temporal Boundaries**

For the purpose of the assessment, the existing environment was defined for 2010. The past temporal boundary was set at 32 years to coincide with the hydraulic data that defines the historical operating range of the Pointe du Bois forebay. This boundary also reflects the stable environment of the developed Winnipeg River as the baseline scenario. The past temporal boundary also includes the period 2006 to 2010, in which the environmental studies, to define the existing environment for the assessment, were carried out. The future temporal boundary was set at 10 years to include the five-year construction period and a five-year post-construction monitoring period of the Project.

## **6.6 Environmental Studies and Consultation**

The environmental studies were initiated in the spring of 2006 with the decision to modernize the generating facilities at Pointe du Bois. In 2009, the Project was redefined to only a spillway replacement and further studies were undertaken specific to the new project. Study reports and technical memorandums used for the EIS are listed in the references.

### **6.6.1 Physical Environment Studies**

The majority of the physical environment studies were completed within the study area. An exception to this was the climate studies.

## 6.6.2 Aquatic Environment Studies

The aquatic environment studies were completed within the study area as well as limited study of water quality downstream to Numao Lake.

## 6.6.3 Terrestrial Environment Studies

The terrestrial environment studies were carried out within the study area. Specific studies were also carried out in the construction footprint area of the spillway replacement project as well as in the vicinity of potential material source areas that would be used for Project construction.

## 6.6.4 Socio-Economic Studies

Information for the assessment was gathered within the socio-economic study area.

A full description of the information from the environmental studies is contained in Chapter 7.0 of this EIS.

## 6.6.5 Consultation

Consultation and communication are an important part of the planning and assessment process for projects. Stakeholder issues and concerns respecting the Project were identified through consultation, meetings and open houses. The information obtained from the consultation program was considered in Project design and construction.

A summary of the issues/concerns obtained through the consultation program relating to the Project is contained in Chapter 5.0 of this EIS.

## 6.7 Environmental Components

The environmental assessment considered the existing environment without the Project as the **baseline condition**. The amount of detail and effort in analysing the various environmental components was proportional to their potential to be affected by the Project and the associated construction infrastructure. The environmental components were organized into the following sections:

- ◆ Physical Environment–Air Quality, Noise, Climate, Surface **Water Regime**, Ice, **Physiography** and **Landscape**, Erosion, Sedimentation, Woody Debris, and Groundwater;
- ◆ Aquatic Environment–Water Quality, Sediment Quality, **Aquatic Habitat**, Lower **Trophic Levels**, Fish Community and Fish Quality;
- ◆ Terrestrial Environment–Wetland Vegetation, Terrestrial Vegetation and Rare Plants, **Invertebrates**, **Amphibians** and **Reptiles**, Birds and Mammals; and

- ◆ Socio-Economic Environment–Economy, Property Ownership and Land use, Infrastructure and Services, Personal, Family and Community Life, Municipal and Local Government District Controls, Recreational Use and Tourism, and **Heritage Resources**.

## 6.8 Project/Environment Interaction

The Project has been described by phases and components. The Project-environment interaction matrix (Table 6.1) identifies the work and activities associated with the Project that may affect the environment. Predicted changes to the environment caused by the Project were assessed and measured against the baseline condition.

## 6.9 Valued Environmental Components

Valued Environmental Components (VECs) are features of the environment that are considered to be important by the proponent, public, scientists and government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern and their potential vulnerability to be affected by the Project. The VECs for the Project were identified for the assessment by:

- ◆ Scoping of the Project and interactions with its various phases and the various environmental components to determine potential vulnerability, (Table 6.1);
- ◆ Consulting with interested parties to determine issues important to them (Table 6.2); and
- ◆ Applying specialist knowledge and advice to refine an appropriate list of VECs for the assessment.

This process resulted in a list of VECs that were used to:

- ◆ Develop and implement appropriate field study program/surveys;
- ◆ Incorporate design measures into the Project to protect VECs;
- ◆ Focus the assessment; and
- ◆ Assess residual environmental and cumulative effects.

The VECs identified for the Project were as follows:

- ◆ Aquatic environment: lake sturgeon, walleye, and northern pike;
- ◆ Terrestrial environment: Merritt Fernald’s sedge, white wood aster, eagle, osprey, Canada warbler, monarch butterfly, northern leopard frog, and common snapping turtle; and
- ◆ Socio-economic environment: employment, business opportunities and enjoyment of local area.

The VECs are listed in Table 6.3 along with the rationale of why they were selected. VECs were not identified for the physical environment as effects to the physical environment can be illustrated through effects to the aquatic, terrestrial and/or socio-economic environment.

## 6.10 Mitigation Measures

Incorporation of mitigation to deal with potential effects to lake sturgeon habitat and local stakeholders (i.e., cottagers) were key components during the design of the Project. In general, where potential adverse environmental effects were identified, technically and economically feasible mitigation measures to address the adverse effects were also identified.

## 6.11 Significance of Residual Adverse Effects

Following application of mitigation measures, any residual adverse effects were identified for determination of their significance. If **residual effects** were not anticipated, then significance was not determined.

Determination of the significance of any residual adverse effects considered scientific study, professional judgement and local knowledge and related to all phases of the Project: construction, decommissioning of existing facilities, and operation and maintenance. The assessment approach first assessed the residual adverse effects in consideration of individual factors and definitions as outlined in Table 6.4.

A combination of the factors as described in Table 6.5 was then used to conclude whether or not the adverse residual effects were significant.

## 6.12 Cumulative Effects

Environmental effects of existing and future projects were considered in the assessment to determine the potential of cumulative effects of those projects with the environmental effects of the Project. The cumulative effects assessment is contained in Chapter 9.0 of this EIS.

Table 6.1: Project-Environment Interaction

Project Phases / Components	Environmental Components																															
	Physical Environment										Aquatic Environment					Terrestrial Environment						Socio-Economic Environment										
	Air Quality	Climate	Noise	Water Regime	Ice	Physiography and Landscape	Erosion	Sedimentation	Woody Debris	Groundwater	Water Quality	Sediment Quality	Aquatic Habitat	Lower Trophic Levels	Fish Community	Fish Quality	Wetland Vegetation	Terrestrial Vegetation and Rare Plants	Invertebrates	Amphibians and Reptiles	Birds	Mammals	Economy	Property Ownership and Land Use	Infrastructure and Services	Personal Family and Community Life	Municipal and Local Government District Controls	Commercial Resource Use	Recreational use and Tourism	Heritage Resources		
<b>Construction</b>																																
Site Preparation	•	•	•			•	•	•	•		•	•	•	•	•		•	•	•	•	•	•	•	•	•	•				•	•	
Townsite Access Roadway	•	•	•			•	•	•										•	•	•			•	•	•					•	•	
Work Areas	•	•	•			•	•	•			•	•	•	•	•		•	•	•	•	•	•	•	•	•					•		
Buildings	•	•	•			•																	•	•		•						
Laydown and Staging Areas	•	•	•			•	•	•			•	•	•	•	•		•	•	•	•			•	•		•						
Concrete Batch Plants and Crushing Operations	•	•	•			•		•			•	•	•	•	•								•		•					•		
Construction Access	•	•	•	•	•	•	•	•			•	•	•	•	•			•	•	•	•	•	•	•	•	•				•	•	
Stabilization of the East Gravity Dam	•	•	•	•			•	•			•	•	•	•	•								•	•		•				•		
Construction / Permanent Power	•	•	•								•	•	•	•	•			•	•	•	•	•	•	•	•					•	•	
Communications	•	•																					•			•						
Water, Wastewater and Waste Management	•	•	•	•							•	•	•	•	•								•		•		•					
Stormwater Management Ponds	•	•	•	•		•		•			•	•	•	•	•				•	•			•		•							
Material Source and Rock Placement Areas	•	•	•	•		•		•		•	•	•	•	•	•		•	•	•	•			•		•					•	•	
Primary Spillway	•	•	•	•	•	•	•	•	•		•	•	•	•	•								•		•		•				•	
Secondary Spillway	•	•	•	•	•	•			•		•	•	•	•	•								•		•		•				•	
Discharge and Approach Channels	•	•	•	•	•	•	•	•	•		•	•	•	•	•								•		•		•				•	
Cofferdams	•	•	•	•	•	•	•	•			•	•	•	•	•								•		•		•				•	
Earth Fill Dams	•	•	•	•	•	•	•	•			•	•	•	•	•								•		•		•				•	
Transition Structures and Wing Walls	•	•	•	•		•					•	•	•	•	•								•		•		•				•	
Decommissioning	•	•	•	•		•					•	•	•	•	•								•		•		•				•	
<b>Operation</b>	•	•	•	•	•	•					•	•	•	•	•								•		•		•				•	

**Table 6.2: Consultation Feedback**

Category	Comment/Concern
<b>Need for the Project</b>	<ul style="list-style-type: none"> <li>◆ Clear recognition of the need to modernize facilities at Pointe du Bois.</li> <li>◆ Strong support for continued power production at Pointe du Bois.</li> </ul>
<b>Economic Opportunities</b>	<ul style="list-style-type: none"> <li>◆ Potential for positive local economic opportunities, including employment.</li> <li>◆ Concern expressed with regard to the loss of operating jobs following construction of the Project.</li> </ul>
<b>Local Considerations</b>	<ul style="list-style-type: none"> <li>◆ Increase traffic volumes as a result of the Project.</li> <li>◆ Public safety / security.</li> <li>◆ Minimize the construction schedule to limit the number of years of disruption to the local area.</li> <li>◆ Minimize construction related noise on weekends and in the evenings.</li> <li>◆ Improve existing boat launch facilities including more parking.</li> <li>◆ Accommodations for workers.</li> <li>◆ Disruption to quiet enjoyment.</li> <li>◆ Change in views/aesthetics from old to new.</li> <li>◆ Future of the townsite at Pointe du Bois.</li> <li>◆ Interest in public access to the east side.</li> <li>◆ Interest in incorporating a boatlift in the design of the new spillway.</li> <li>◆ Interest in preserving heritage elements of the facilities.</li> <li>◆ Decrease in property values.</li> </ul>
<b>Terrestrial</b>	<ul style="list-style-type: none"> <li>◆ Impact to natural landscape as a result of clearing.</li> </ul>
<b>Fish and Wildlife</b>	<ul style="list-style-type: none"> <li>◆ Comments regarding the variety and abundance of fish in the area.</li> <li>◆ Potential impacts on fish, fish habitat and spawning in both construction and operation, focussing on lake sturgeon.</li> <li>◆ Concern regarding wildlife and wildlife habitat in the area.</li> </ul>



**Table 6.2: Consultation Feedback**

Category	Comment/Concern
<p><b>Traffic and Access</b></p>	<ul style="list-style-type: none"> <li>◆ Concern regarding construction traffic and the impacts it would have to:               <ul style="list-style-type: none"> <li>• Condition of PR 313;</li> <li>• Safety on PR 313, minimize heavy truck traffic on the weekends and after dark;</li> <li>• Noise; and</li> <li>• Increased traffic through townsite and cottage areas.</li> </ul> </li> </ul>
<p><b>Water Level, Flow Patterns and Water Quality</b></p>	<ul style="list-style-type: none"> <li>◆ Strong interest in maintaining the present water regime, both upstream and downstream.</li> <li>◆ Concern regarding potential on downstream ice conditions, safety for winter ice crossings and fluctuations in water levels in winter.</li> <li>◆ Concern regarding potential for erosion from fluctuating water levels and flow rates.</li> <li>◆ Concern regarding a change to water currents and flow patterns.</li> <li>◆ Concern regarding impacts on local water quality, both short and long-term.</li> </ul>

Table 6.3: Pointe du Bois Spillway Replacement Project Valued Environmental Components and Rationale

Environmental Component	Valued Environmental Component	Rationale
<b>Aquatic Environment</b>		
Fish Community	Lake sturgeon	<ul style="list-style-type: none"> <li>◆ Has been designated by COSEWIC as “endangered” in the Winnipeg River and is a candidate for a possible listing under the <i>Species at Risk Act</i>;</li> <li>◆ Operation of the new spillway facilities have the potential to alter localized habitat suitability for spawning;</li> <li>◆ Key recreational fish species in the study area;</li> <li>◆ Important species to the public; and</li> <li>◆ Potential Project interaction.</li> </ul>
	Northern pike	<ul style="list-style-type: none"> <li>◆ Important sport fish species; and</li> <li>◆ Potential Project interaction.</li> </ul>
	Walleye	<ul style="list-style-type: none"> <li>◆ Important sport fish species; and</li> <li>◆ Potential Project interaction.</li> </ul>
<b>Terrestrial Environment</b>		
Rare Plants	Merritt Fernald’s sedge	<ul style="list-style-type: none"> <li>◆ MBCDC S1 rank (very rare); and</li> <li>◆ Present in Project footprint area, therefore potential Project interaction.</li> </ul>
	White wood aster	<ul style="list-style-type: none"> <li>◆ MBCDC S1 rank (very rare); and</li> <li>◆ Present in Project footprint area, therefore potential Project interaction.</li> </ul>
Birds	Eagle	<ul style="list-style-type: none"> <li>◆ Protected species under the <i>Manitoba Wildlife Act</i>; and</li> <li>◆ Potential Project interaction.</li> </ul>
	Osprey	<ul style="list-style-type: none"> <li>◆ Protected species under the <i>Manitoba Wildlife Act</i>; and</li> <li>◆ Potential Project interaction.</li> </ul>
	Canada warbler	<ul style="list-style-type: none"> <li>◆ SARA, Schedule 1 - threatened; and</li> <li>◆ Potential Project interaction.</li> </ul>
Invertebrates	Monarch butterfly	<ul style="list-style-type: none"> <li>◆ SARA, Schedule 1 - special concern; and</li> <li>◆ Potential Project interaction.</li> </ul>
Amphibians and Reptiles	Northern leopard frog	<ul style="list-style-type: none"> <li>◆ SARA, Schedule 1 - special concern; and</li> <li>◆ Potential Project interaction.</li> </ul>
	Common snapping turtle	<ul style="list-style-type: none"> <li>◆ SARA, Schedule 1 - special concern; and</li> <li>◆ Potential Project interaction.</li> </ul>

Table 6.3: Pointe du Bois Spillway Replacement Project Valued Environmental Components and Rationale

Environmental Component	Valued Environmental Component	Rationale
<b>Socio-economic Environment</b>		
<b>Economy</b>	<b>Employment</b>	<ul style="list-style-type: none"> <li>◆ Project will increase employment opportunities in the area; and</li> <li>◆ Important issue to Aboriginal groups and other interested parties.</li> </ul>
	<b>Business opportunities</b>	<ul style="list-style-type: none"> <li>◆ Project will have a effect on businesses in the area; and</li> <li>◆ Important issue to Aboriginal groups and other interested parties.</li> </ul>
<b>Personal, Family and Community Life</b>	<b>Enjoyment of local area</b>	<ul style="list-style-type: none"> <li>◆ Project construction activities will disrupt the normal enjoyment of the area for residents, cottagers and other users;</li> <li>◆ Construction activities associated with the Project increases road and water traffic, increasing the potential for accidents;</li> <li>◆ Construction activity may draw public attention resulting in the potential for unauthorized access by the public to the construction site;</li> <li>◆ Increased noise related to construction activities and blasting in an area used primarily as a recreational area; and</li> <li>◆ Local area is a prime recreational area.</li> </ul>

**Table 6.4: Factors and Definitions to Assess Environmental Effects and Determine Significance**

Factor	Definition
<b>Magnitude</b>	<b>Small:</b> <ul style="list-style-type: none"> <li>◆ Unlikely to be detectable or measurable, or</li> <li>◆ Below established thresholds of acceptable change, or</li> <li>◆ Within range of natural variability, or</li> <li>◆ Minimal impairment of ecosystem component's function</li> </ul>
	<b>Moderate:</b> <ul style="list-style-type: none"> <li>◆ Effect could be detectable within normal range of variation of a well-designed monitoring program, or</li> <li>◆ Marginally beyond guidelines, or</li> <li>◆ Marginally beyond range of natural variability, or</li> <li>◆ Marginally beyond minimal impairment of ecosystem, or component's function</li> </ul>
	<b>Large:</b> <ul style="list-style-type: none"> <li>◆ Readily detectable without a monitoring program, or</li> <li>◆ Well beyond guidelines, or</li> <li>◆ Well beyond range of natural variability, or</li> <li>◆ Well beyond minimal impairment of ecosystem component's function</li> </ul>
<b>Geographic Extent</b>	<b>Site:</b> <ul style="list-style-type: none"> <li>◆ A small portion of local area</li> </ul>
	<b>Local:</b> <ul style="list-style-type: none"> <li>◆ Beyond the site and within the local area</li> </ul>
	<b>Regional:</b> <ul style="list-style-type: none"> <li>◆ Beyond the local study area and within the regional study area.</li> </ul>
<b>Duration</b>	<b>Short-term:</b> <ul style="list-style-type: none"> <li>◆ Generally within the construction period, or</li> <li>◆ Within one generation or recovery cycle</li> </ul>
	<b>Medium-term:</b> <ul style="list-style-type: none"> <li>◆ Transition period during the operations phase, or</li> <li>◆ Within one or two generations or recovery cycles</li> </ul>
	<b>Long-term:</b> <ul style="list-style-type: none"> <li>◆ Long term during the operations phase or permanent, or</li> <li>◆ Two or more generations or recovery cycles</li> </ul>

**Table 6.4: Factors and Definitions to Assess Environmental Effects and Determine Significance**

Factor	Definition
Frequency	<b>Low:</b> <ul style="list-style-type: none"> <li>◆ Seldom</li> </ul>
	<b>Moderate:</b> <ul style="list-style-type: none"> <li>◆ Occasionally</li> </ul>
	<b>High:</b> <ul style="list-style-type: none"> <li>◆ Continuously or at regular intervals</li> </ul>
Reversibility	<b>Reversible:</b> <ul style="list-style-type: none"> <li>◆ Readily reversible over a short period</li> </ul>
	<b>Moderately Reversible:</b> <ul style="list-style-type: none"> <li>◆ Not readily reversible during the life of the project</li> </ul>
	<b>Not Reversible:</b> <ul style="list-style-type: none"> <li>◆ Effect is permanent</li> </ul>
Uncertainty	<b>Low:</b> <ul style="list-style-type: none"> <li>◆ Prediction is certain</li> </ul>
	<b>Moderate:</b> <ul style="list-style-type: none"> <li>◆ Prediction of effect is somewhat certain, monitoring may be required to confirm</li> </ul>
	<b>High:</b> <ul style="list-style-type: none"> <li>◆ Prediction of effect is uncertain, monitoring and contingency plan required</li> </ul>

Table 6.5: Combination of Factors to Determine Significance

Table 6.5: Combination of Factors to Determine Significance			
Analysis Criteria			Combination Significant? – Yes/No
Magnitude	Geographic Extent	Duration	
Large	Regional	Long-term	Yes
		Medium-term	Yes
		Short-term	Yes
	Local	Long-term	Yes
		Medium-term	Yes
		Short-term	No
	Site	Long-term	Yes
		Medium-term	No
		Short-term	No
Moderate	Regional	Long-term	Yes
		Medium-term	No
		Short-term	No
	Local	Long-term	No
		Medium-term	No
		Short-term	No
	Site	Long-term	No
		Medium-term	No
		Short-term	No
Small	Regional	Long-term	No
		Medium-term	No
		Short-term	No
	Local	Long-term	No
		Medium-term	No
		Short-term	No
	Site	Long-term	No
		Medium-term	No
		Short-term	No