

## 2.0 ALTERNATIVES TO AND ALTERNATIVE MEANS

This chapter outlines the alternates considered for the **modernization** of the Pointe du Bois Generating Station. The chapter also discuss the alternative means to implement the spillway replacement project.

Following the acquisition of the Pointe du Bois Generating Station in 2002, Manitoba Hydro initiated a process to assess options to modernize the generating station facilities. The generating station required modernization in order to upgrade the facility to address dam safety guidelines, address the aging structures, provide a safer working environment for staff, and maintain safe and efficient operation for power production.

### 2.1 Alternatives Considered

A number of alternatives were considered as part of a long-term planning process for the modernization of the Pointe du Bois Generating Station. These alternatives are outlined below:

- ◆ Rebuild

The rebuild alternative would involve the construction of a new spillway and new powerhouse and the decommissioning of all existing water retaining structures. The new spillway and dam would be built to modern operating, safety and environmental standards in an area adjacent to the location of the existing facilities. **Generating capacity** would be increased from 78 MW to approximately 120 MW.

- ◆ Renovate

The renovate alternative would involve the construction of a new spillway, the installation of new **generators** and replacement of systems within the existing powerhouse, and rehabilitation of the powerhouse structure. The existing spillway would be decommissioned. Generating capacity would be increased from 78 MW to approximately 120 MW.

- ◆ Repair

The repair alternative would involve the construction of a new spillway and the continued operation of the powerhouse with replacement or repair of all structures and systems as necessary to bring the plant to acceptable modern safety and operating standards. The existing spillway would be decommissioned. Generating capacity could be increased to approximately 85 MW.

- ◆ Decommission the Powerhouse

This decommission alternative would involve the construction of a new spillway and the decommissioning of the existing spillway and powerhouse. The

established water regime would be generally maintained, but power would not be generated. This alternative was not considered **feasible** due to the loss of 78 MW of generating capacity and the negative **impact** on **energy** reliability in southern Manitoba.

- ◆ Decommission the Facility

This decommission alternative would involve removing all structures and returning the site to the state of nature. This alternative was considered to be **unfeasible** as the established water regime would be drastically altered and the loss of 78 MW of generating capacity would negatively impact energy reliability in southern Manitoba.

Manitoba Hydro conducted initial **public consultations** on the three feasible alternatives, namely, the rebuild, renovate, and repair alternatives. Public **open houses** were held in Pointe du Bois, Lac du Bonnet and Winnipeg during February 2007. In addition, meetings were held with Sagkeeng First Nation and local Manitoba Metis Federation representatives. Input and feedback from these open houses and meetings were useful in helping Manitoba Hydro scope the issues associated with the three principal alternatives that were under consideration.

Following internal analysis and feedback from the initial public consultation and **Aboriginal** meetings, Manitoba Hydro decided, in June 2007, to proceed with the rebuild alternative for modernization. The environmental assessment work and studies, which had begun in 2006, were continued on the basis of the rebuild alternative.

In 2009, as a result of rising construction costs and the change in the global economy, Manitoba Hydro reviewed the scope of the modernization at Pointe du Bois and decided to discontinue work toward the rebuild alternative. The 2009 review of modernization at Pointe du Bois resulted in the decision that the scope of the modernization would be a spillway replacement project. This decision was made with due consideration of economic/financial factors, dam safety, personnel safety, the age of the existing structures, risks to the environment, and benefits to energy reliability in southern Manitoba. The existing powerhouse will continue to operate with on-going activities to maintain safety and reliability.

## 2.2 Alternative Chosen

Manitoba Hydro will be replacing the spillway facilities at Pointe du Bois. Spillway replacement will consist of constructing a new primary spillway with approach and discharge channels, a new secondary spillway, transition structures and wing walls and earthfill dams. With these improvements, the current Canadian Dam Association Dam Safety Guidelines (2007) will be addressed. The existing spillway will be decommissioned after construction of the new spillways and dams.

## 2.3 Alternative Means to Implement

Manitoba Hydro developed numerous general arrangements and variations as part of the initial design of the rebuild alternative. The engineering, environmental, and socio-economic studies undertaken on developing these arrangements provided Manitoba Hydro comprehensive knowledge of the area and more specifically the primary considerations required to select a suitable general arrangement of structures. Interactions with regulators and local **stakeholders** throughout the rebuild design process provided additional insight into the necessary considerations. These past efforts by Manitoba Hydro aided in focusing the efforts in developing options for implementing the replacement of the spillway.

Two alternative spillway replacement designs were evaluated, one in the central portion of the river and another near the east shore. A schematic of the two arrangements considered are shown in Figures 2.1 and 2.2.

## 2.4 Selection Criteria and Discussion

Manitoba Hydro developed criteria for evaluating spillway general arrangements based on its experience with the Pointe du Bois Rebuild Project and other Manitoba Hydro projects. The considerations used to evaluate the two general arrangements were:

- ◆ Dam safety;
- ◆ Sturgeon **habitat**;
- ◆ Stakeholder **effects**;
- ◆ Constructability;
- ◆ Provisions for a future powerhouse; and
- ◆ Cost

### 2.4.1 Dam Safety

Both the east side and central spillways would increase the spill capacity of the station to address current dam safety guidelines once constructed. However, during construction the central spillway alternative would have a temporary reduction in the existing station **discharge capacity**. During construction of the east side spillway, discharge capacity would not be affected.

### 2.4.2 Sturgeon Habitat

Numerous studies related to sturgeon habitat have been undertaken at Pointe du Bois since 2006. These studies identified a number of criteria that would assist in optimizing the general arrangement to maintain or potentially increase useable sturgeon habitat in

the immediate vicinity of the Pointe du Bois generating station. These criteria include the following:

- ◆ Avoid in-water work in known lake sturgeon **spawning** areas;
- ◆ Maintain flow over the known spawning areas;
- ◆ Preserve turbulent flow on the east side of the spillway shelf;
- ◆ Provide opportunity for use of the spillways for adaptive management of water flows over downstream lake sturgeon spawning habitat; and
- ◆ Maintain the location of the spillway on the upper portion of shelf.

The east side alternative provided benefits associated with all these criteria.

### **2.4.3 Stakeholder Considerations**

Feedback during public open houses indicated that local stakeholders were concerned with noise, traffic on public roadways, maintenance of historic water levels and maintenance of the water flow characteristics immediately downstream of the facility. The east side alternative would provide a number of benefits with respect to these issues that include the opportunity to remove the primary construction activities away from cottages and to reduce traffic on public roadways due to the availability of rock and impervious borrow materials on the east side of the river. The east side arrangement would also be able to maintain the flow characteristics downstream of the facility.

### **2.4.4 Constructability**

The constructability of both arrangements was evaluated based on a variety of considerations. These include the ease of construction access, ability to use cost effective construction techniques, difficulty in river management during construction, ability to minimize financial risk to a contractor, availability of construction materials, impacts to the construction schedule, and environmental considerations.

Benefits and detriments to the constructability of both arrangements were apparent. Some of these considerations are outlined below:

- ◆ Access to the east side would be more complicated and costlier than the central spillway, which would have had direct road access.
- ◆ The central spillway would require a more complex river management scheme.
- ◆ Blasting required for excavation of the approach and discharge channels of the central spillway arrangement would be closer to the existing structures, increasing the potential for damage to the structures.

### 2.4.5 Accommodate Future Powerhouse

Both spillway alternatives had options for the location of a powerhouse, should one be considered in the future. The possible location of a potential future powerhouse is shown on Figures 2.1 and 2.2. The location of a future powerhouse would be re-evaluated in the future should it be determined that replacement of the powerhouse is required.

### 2.4.6 Cost

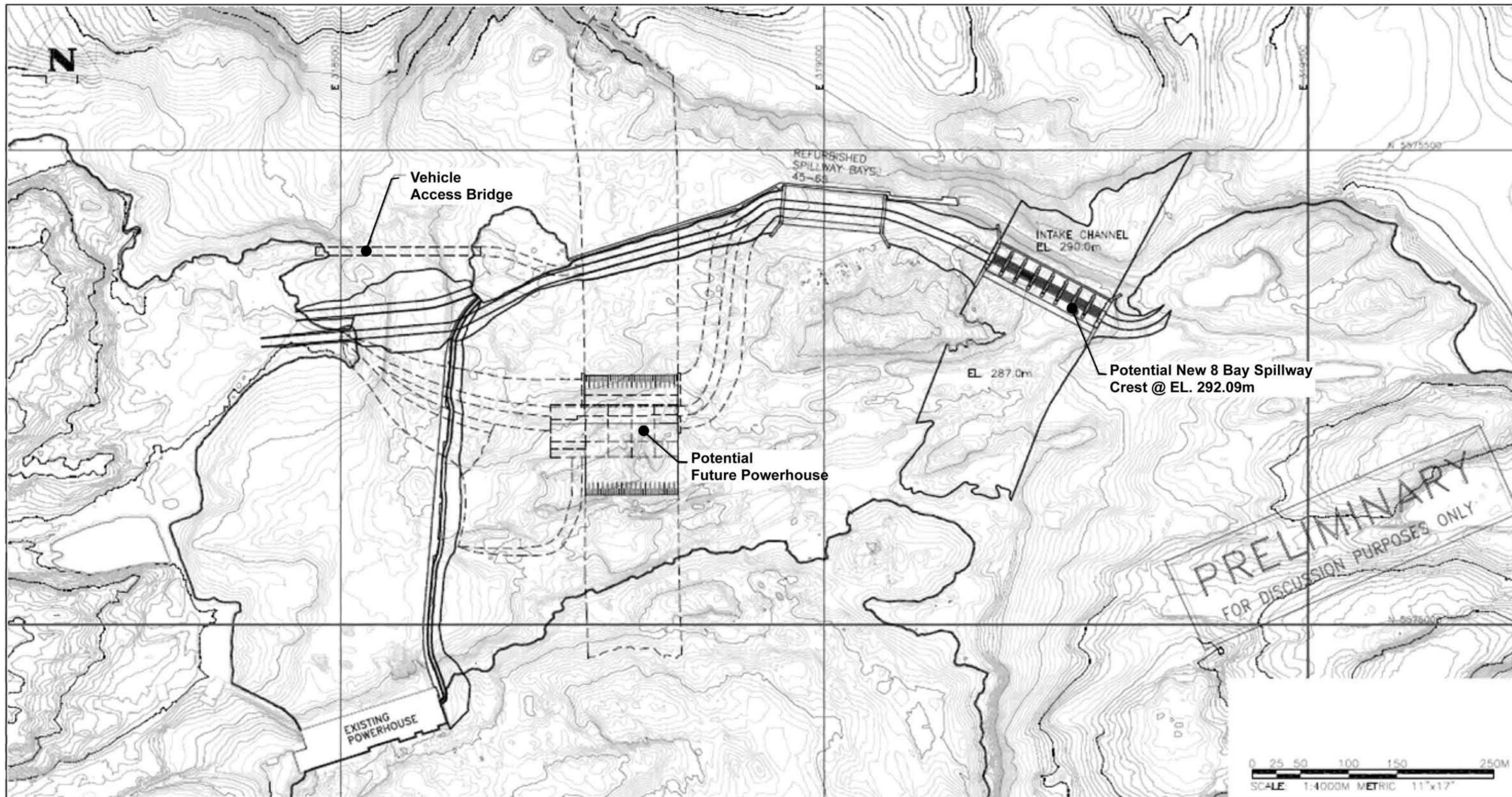
Cost estimates for both arrangements were calculated and were similar in **magnitude**.

## 2.5 Conclusion

Based on the evaluation of the primary considerations above, the east side alternative was determined to be the preferred general arrangement and provide the optimum general arrangement. Of specific note, the east side alternative met criteria developed for maintaining protection of lake sturgeon spawning habitat.

During the design of the principal structures and the associated construction infrastructure, environmental effects that may result from the project work were identified. In many cases, aspects of the Project could be designed to minimize or avoid adverse environmental effects. A summary of these features is provided in Section 8.3.

It is noted that both concepts as shown in Figures 2.1 and 2.2 originally maintained portions of the existing spillway as part of the general arrangements. Further condition assessments of the existing spillway structures indicated that replacing all existing spillway structures was necessary.



Coordinate System: UTM NAD 1983 Z15

DATA SOURCE:

Manitoba Hydro, KGS Acres

DATE CREATED:

17 MAY 2011

CREATED BY:

HPP - Pointe du Bois Planning

REVISION NO:

VERSION 1.0

REVISION DATE:

25 MAY 2011

QA/QC:

RHP, MWZ, BMP

**Pointe du Bois  
Spillway Replacement Project**

Conceptual - Alternative 1  
East Side Spillway

Figure:  
2.1

